Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 57 NO 9, SEPTEMBER 1989

• Tilt-over Mast • Pedal Wireless • Source and Load Impedances •

OUT NOW

At all good newsagents and bookstalls

Electronics Today

SEPTEMBER

eti

ELECTRONICS · TECHNOLOGY
INNOVATION

Video piracy — we're the best!

Nice work if you can get it

Test and measurement

Part 2

PROJECTS TO BUILD:

Programmable amp/equaliser
16-bit VGA card Part 2

PLUS

eti Sound Insights

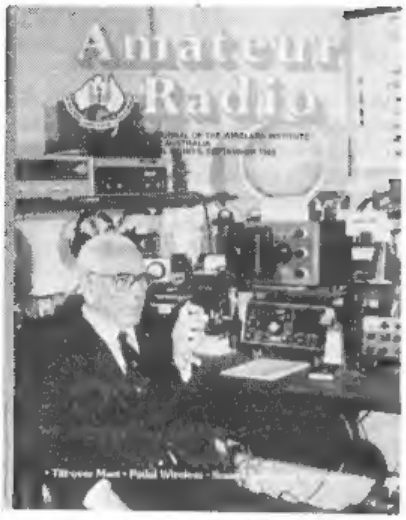
AUSTRALIA'S HIGHEST CIRCULATING HI-FI MAGAZINE

Sound Ideas — Sound Advice — Sound Products

More information and 84 pages of colour!

CAN YOU AFFORD NOT TO READ IT?

Amateur Radio



Cover

Amateur Radio's "Elder Statesman" Bill Gronow VK3WG, pictured at his rig. See text of his Remembrance Day Opening Address and autobiography on page 6. Photo - John Friend VK3ZAB.

Deadlines

	Editorial	Hamads
October	11/9/89	13/9/89
November	9/10/89	11/10/89
December	6/11/89	8/11/89

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly**.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING : Redfords Media, 25 Glenferrie Rd, Malvern 3144, Tel: (03) 500 0377

PRINTING: Industrial Printing, Richmond

MAIL DISTRIBUTION: Polk Mailing Co., PO Box 140, Collingwood, Vic. 3066, Tel:(03) 417 5161

Opinions expressed by individuals are not necessarily those of the Wireless Institute of Australia.

Special Features

Weather Satellites - Paul Hayden VK4ZBV 22
Fatal Distraction or is Amateur Radio a Health Hazard ? - Morris Odell VK3DOC.....34
JOTA - 1989 - Peter Hughes VK6HU 35
RD Opening Address and Autobiography 6

Technical Articles

The Unique Pedal Wireless - Mervyn Eunson VK4SO 7
Output Impedance, Source Impedance, Load Impedance - Lloyd Butler VK5BR 10
A Tilt-Over Wind-Up Antenna Mast - Leigh Baker VK5UO 16
Early Background of Our Telegraph Codes - Lloyd Butler VK5BR 24
The Coil-Winding Wisdom of Solomon-Commodore 64 Version - Rob Abel VK2ERA ..30

Regular Features

Advertisers' Index.....64
ALARA 52
AMSAT Australia.....49
AR Showcase 59
Awards, Fisher's Ghost, Tassie Trout 43
Club Corner.....58
Contests - Calendar, John Moyle Results 41
- VK-ZL-Oceania Rules.....42
Data & Digital Communications.....45
Divisional Notes, VK4, 5/8th Wave, VK6 53
Editor's Comment.....2
EMC Report 54
Hamads.....62
How's DX? 38
Intruder Watch 50
Morseword No. 30 20
Over to You - Members Opinions 60
Pounding Brass 44
QSL's of the WIA Collection 56
Silent Keys - Obituaries.....60
Spotlight on SWLing 54
Stolen Equipment 60
VHF-UHF : An Expanding World.....39
WIA Directory.....3
WIA News 4
WICEN 55

Amateur Radio

Published monthly as the Official Journal by the Wireless Institute of Australia, founded 1910. ISSN 0002 - 6859. Registered Office: 3/105 Hawthorn Road, Caulfield North, Vic 3161. Telephone: (03) 528 5962.

EXECUTIVE EDITOR
Bill Rice VK3ABP
MANAGING EDITOR
Graham Thornton VK3IY
NEWS EDITOR
Jim Linton VK3PC
TECHNICAL EDITING CO-ORDINATOR
Peter Gibson VK3AZL
TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Evan Jarman VK3ANI
Peter O'Connor VK4KIP
Gil Sones VK3AUI
Phil Steen VK4APA
MARKETING
Bruce Kendall VK3WL
CONTRIBUTING EDITORS
Brian Beamish VK4AHD
Frank Beech VK7BC
Joy Collis VK2EBX
Brenda Edmonds VK3KT
Ron Fisher VK3OM
Norm Gomm VK1GN
Ken Gott VK3AJU
Gilbert Griffith VK3CQ
Roy Hartkopf VK3AOH
Robin Harwood VK7RH
Ron Henderson VK1RH
Maurie Hooper VK5EA
Bill Horner VK4MWZ
Eric Jamieson VK5LP
Patrick Kelly VK2RZ
Tim Mills VK2ZTM
Hans Ruckert VK2AOU
John Sparkes VK6JX
Jennifer Warrington VK5ANW
DRAFTING
Vicki Griffin VK3BNK

Inquiries and material to the Editor: PO Box 300, Caulfield South, VIC 3162.

Advertising: Ann McCurdy (03) 528 5962

Material should be sent direct to PO Box 300, Caulfield South, Vic. 3162, in accordance with the deadline date shown on page 1 of this issue.

Acknowledgement may not be made unless specifically requested. All important items should be sent by Certified Mail. The editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

EDITOR'S COMMENT

Unity in Diversity

Just a short hop across the Timor Sea, Australia's near neighbour is the Republic of Indonesia. Its 180 million people are spread through more than 13,000 islands. They represent about 300 different ethnic groups and speak 250 different languages. The official language is the relatively new Bahasa Indonesia, but the motto on the Indonesian national crest is in the old Javanese language; "Bhinneka Tunggal Ika", which means "Unity in Diversity". Amateur Radio is alive and well in YB land, although it is only since the accession of President Suharto in 1965 that it has been permitted.

A longer hop across the Pacific brings us to the country which might be described as the home of amateur radio, the United States of America (even though our WIA predates the ARRL by four years). There are about 220 million Americans, and they belong to one of the most highly developed multi-racial societies on earth. But the American national motto is not in English, but in Latin; "E pluribus unum", which translates as "One from Many". A very similar meaning to the Indonesian motto.

The WIA does not have a motto, but if we did, I imagine the same theme would be appropriate. I am sure that the whole succession of our Federal Presidents since the position began have hoped to preside over a close amalgamation between our sometimes divergent State Divisions. As Peter Gamble reported on this page last month, we are getting closer to operating like a coherent national organisation. At the first of the newly introduced series of quarterly Executive/Federal Council meetings, all Divisions being represented, the trend towards better understanding of each other's requirements was plainly evident.

Nevertheless, there were obvious differences between the Divisions, particularly in regard to the Divisional component of annual subscriptions. While the originally proposed figure of $23 (later reduced to a recommended $16) was acceptable to the larger Divisions, others claimed to need much less to carry out their functions. Why the difference? Since few members, other than those who have served or are serving in a Federal position, are aware of the many differences between Divisions in their organisation and facilities, I though it might be informative to summarise them here.

The largest Division (VK2) is the only one to own its own office and meeting centre, although due to the wide decentralisation of membership into regional clubs, Division general meetings are seldom held. Administration, for over 2000 members, necessitates paid staff. The Division owns all the equipment used for its news broadcasts, and the station real estate. It also plays a large part in providing repeaters throughout the State. Similar conditions apply to VK3, also with over 2000 members, except that it has recently sold its meeting centre and invested the funds. As in VK2, Divisional meetings are rare, but there are many active clubs.

In VK4, with over 1200 members, the situation is quite different. The Division owns no property, and even the Sunday broadcasts are carried by privately-own equipment. All administration is by volunteers. There are active clubs throughout the very large State, and they play a large part in determining Divisional policy. VK5 also owns no property, but has a long-term lease on the modified Burley Griffin incinerator building at Thebarton (under National Trust protection), and this provides an excellent meeting centre which is regularly used, as it is centrally located for a large proportion of Adelaide amateurs (and Adelaide's population is more than three quarters that of the whole State of SA).

Moving on to the West, the VK6 situation is not unlike VK5. Each has less than 1000 members and the population outside Perth is (like Adelaide) much less than that of the capital. So again, we find that regularly Divisional meetings are well-attended, and the cost of volunteer administration is low. But there is a big difference from the other States, in that the provision of amateur repeaters is vested in a separate body, separately funded, the WA Repeater Group, so is not a Divisional responsibility.

In the two smallest Divisions the picture is different again. The VK7 membership is about 300, split between three Branches. But the size of Tasmania is such that distances are not a great problem, and administration is readily handled by volunteers. VK1 is even more centralised, and in effect, one club is also the Division, with less than 300 members and only required to cover the small area of the ACT. The only State capital smaller than Canberra is Hobart, so distances are of no significance.

So, there we have our Divisions, briefly outlined. Diversity indeed! Is it not to be expected that needs and procedures will differ considerably, as a result of different circumstances? But unity is also essential. In this context it is self-evident that "United we stand, divided we fall". It is for all of us essential that we work towards harnessing and harmonising our differences. At least we have in amateur radio an activity in which there are few problems of race or language, even on a world wide basis. Surely in Australia we ought to be able to "get our act together!"

Bill Rice VK3ABP
Executive Editor

WIA DIRECTORY

Federal Council

Kevin Olds	VK1OK	ACT Councillor
Peter Jeremy	VK2PJ	NSW Councillor
Peter Mill	VK3ZPP	Victorian Councillor
David Jerome	VK4YAN	Queensland Councillor
Bill Wardrop	VK5AWM	SA Councillor
Neil Penfold	VK6NE	WA Councillor
Joe Gelston	VK7JG	Tasmanian Councillor

Executive

Peter Gamble	VK3YRP	Federal President
Ron Henderson	VK1RH	Vice Chairman
Brenda Edmonds	VK3KT	Federal Education Officer
Bill Rice	VK3ABP	Editor Amateur Radio
George Brzostowski	VK1GB	Federal Executive
Kathy Gluyas	VK3XBA	Federal Treasurer
David Wardlaw	VK3ADW	Immediate Past Federal President

Federal Co—ordinators

Amsat	Graham Ratcliff	VK5AGR
Awards Mgr	Ken Gott	VK3AJU
Contest Mgr	Frank Beech	VK7BC
Education	Brenda Edmonds	VK3KT
EMC	Hans Ruckert	VK2AOU
Historian	John Edmonds	VK3AFU
Intruder Watch	Gordon Loveday	VK4KAL
Int'l Travel Host Exch	Ash Nallawalla	VK3CIT
QSL Mgr (VK9, VKØ)	Neil Penfold	VK6NE
Standards & FTAC	Rob Milliken	VK1KRM
Tapes (Federal News)	Bill Roper	VK3ARZ
	Ron Fisher	VK3OM
Videotape	John Ingham	VK5KG
WICEN	Bill Wardrop	VK5AWM

Executive Office

Bill Roper	VK3ARZ	General Manager & Secretary
Ross Burstal	VK3CRB	Deputy General Manager
Ann McCurdy		Advertising & Administration
Helen Wageningen		Membership & Circulation
June Fox		Accounts & EDP
Earl Russell	VK3BER	EDP Consultant
Ron Fisher	VK3OM	Librarian

DIVISIONS

VK1

Address: ACT Division, GPO Box 600, Canberra ACT 2601

Officers:

President	Ted Pearce	VK1AOP
Secretary	Jan Burrell	VK1BR
Treasurer	Ken Ray	VK1KEN

Broadcasts: 3.570 MHz, 2m ch 6950, 70cm ch 8525, 2000 hrs Sun

Fees:

(City)	Full (F)	$44.00
	Assoc (A)	$44.00
(Country)	Full (C)	$44.00
	Assoc (T)	$44.00
	Pens. (G)	$33.00
	Stud. (S)	$31.00
	Family (X)	$25.00

VK2

Address: NSW Division, 109 Wigram St, Parramatta NSW 2124, (PO Box 1066 Parramatta), Phone (02) 689 2417

Officers:

President	Roger Henley	VK2ZIG
Secretary	Peter Balnaves	VK2CZX
Treasurer	David Horsfall	VK2KFU

Broadcasts: (R Denotes repeater) Times 1100 and 1915 on Sun
1.845 MHz AM, 3.595 AM/SSB , 7.146 AM (1100 only)
28.320 SSB, 52 120 SSB 52.525 FM
147.000 FM(R) 438.525 FM(R)
584.750 (ATV Sound) Relays also conducted via many repeaters throughout NSW.

Fees:

F	$41.50
A	$39.50
C	$41.50
T	$39.50
G	$34.50
S	$22.50
X	$24.50

VK3

Address: Victorian Division, 38 Taylor St, Ashburton Vic 3147, Phone (03) 259 9261

Officers:

President	Jim Linton	VK3PC
Secretary	Barry Wilton	VK3XV
Treasurer	Rob Halley	VK3XLZ

Broadcasts: 1.840 MHz AM, 3.615 SSB,
7.085 SSB, 147.250 FM(R) Mt Macedon
147.225 FM(R) Mt Baw Baw
146.800 FM(R) Mildura
438.075 FM(R) Mt St Leonard 1030 hrs on Sun

Fees:

F	$50.00
A	$45.00
G	$36.00
S	$27.00
X	$27.00

VK4

Address: Queensland Division, GPO Box 638, Brisbane Qld 4001, Phone (07) 284 9075

Officers:

President	David Jones	VK4NLV
Secretary	John Aarsse	VK4QA
Treasurer	Eric Fittock	VK4NEF

Broadcasts: 3.605 MHz, 7.118, 14.342,
18.132, 21.175, 28.400,
52.525 regional 2m repeaters and
1296.100 0900 hrs Sunday
Repeated on 3.605 & 147.150 MHz, 1930 Mon

Fees:

F	$45.00
A	$45.00
C	$45.00
T	$45.00
G	$36.00
S	$27.00
X	$27.00

VK5

Address: South Australian Division, Thebarton Rd, West Thebarton SA 5031, (GPO Box 1234 Adelaide SA 5001), Phone (08) 352 3428

Officers:

President	Don McDonald	VK5ADD
Secretary	Hans van der Zalm	VK5KHZ
Treasurer	Bill Wardrop	VK5AWM

Broadcasts: 3.550 MHz, 14.175, 28.470, 53.100,
147.000 FM(R) Adelaide
146.700 FM(R) Mid North
146.900 FM(R) South East
ATV Ch 34 579.00 Adelaide
ATV 444.250 Mid North
(NT)3.555, 146.500, 0900 hrs Sun

Fees:

F	$44.00
A	$44.00
C	$44.00
T	$44.00
G	$35.00
S	$26.00
X	$26.00

VK6

Address: West Australian Division, PO Box 10, West Perth WA 6005, Phone (09) 474 2626

Officers:

President	Alyn Maschette	VK6KWN
Secretary	Pending	
Treasurer	Bruce Hedland - Thomas	VK6OO

Broadcasts: 146.700 FM(R) Perth, at 0930 hrs Sun,
relayed on 3.560, 7.075, 14.115,14.175,
21.185, 28.345, 50.150, 438.525 MHz
Country relays 3582, 147.350(R) Busselton
146.900(R) Mt William (Bunbury)147.225(R)
147.250 (R) Mt Saddleback 146.725(R)
Albany 146.825(R) Mt Barker
Broadcast repeated on 3.560 at 1930 hrs.

Fees:

F	$42.00
A	$42.00
C	$42.00
T	$42.00
G	$35.00
S	$22.00
X	$23.00

VK7

Address: Tasmanian Division, PO Box 1010, Launceston TAS 7250

Officers:

President	Mike Wilson	VK7ZWW
Secretary	Bob Richards	VK7NRR
Treasurer	Peter King	VK7ZPK

Broadcasts: 146.700 MHz FM (VK7RHT) at 0930 hrs Sun
relayed on 147.000 (VK7RAA), 146.750 (VK7RNW),
3.570, 7.090, 14.130, 52.100, 144.100 (Hobart)
Repeated Tues 3.590 at 1930 hrs

Fees:

F	$42.00
A	$42.00
C	$42.00
T	$42.00
G	$38.00
S	$24.00
X	$22.00

VK8 (Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).
Note: all times are local. All frequencies MHz.

WIA NEWS

Bill Roper VK3ARZ, General Manager & Secretary

WIA 80 AWARD

A special award will be offered to mark the 80th anniversary of the world's first and oldest national radio society, the Wireless Institute of Australia.

The award is open to all radio amateurs and shortwave listeners, and wil operate from November 1st, 1989, until December 31st, 1990.

To qualify for the award those living in Australia (except VK9 and VK0) need to contact (log) 80 members of the WIA.

All others need contact only eight WIA members.

Contacts through ground based repeaters are not permitted, although simplex contacts can be pre-arranged via repeaters.

Each WIA member worked on either the 30 metre, 17 metre and 12 metre bands will count as two contacts for the award.

For the contact to be valid, it must include the WIA membership number of the WIA member involved, and the number must be logged.

This number can either be the one which appears on the WIA membership certificate, or the six-digit number on the address label of the WIA journal, Amateur Radio magazine, sent each month to WIA members.

All station callsigns issued in the name of the WIA will share the number 80 as their membership number.

To claim the award as log extract must be submitted that includes the callsigns and membership numbers of the required number of WIA member contacts.

The cost is $A5.00 for claimants in VK, P29, ZL and Oceania. All others submit $US5.00, or eight IRCs.

Requests for awards to be endorsed for conventional modes will only be accepted if all contacts are made in two-way communications in that mode. Cross-mode contacts are not valid for endorsements.

Claims should be made to: WIA 80 Award Manager, Mr Ken Gott, VK3AJU, 38A Lansdowne Road, East St. Kilda, 3183, Victoria, Australia.

WARC NEWS

Radio amateurs throughout the world are very interested whenever a World Administrative Radio Conference, commonly known as a WARC, is to be held. Many rumours and suggestions have been circulating over the past 12 months or so.

At frequent intervals the International Telecommunications Union, which is the specialised agency of the United Nations dealing with telecommunications, issues press releases.

Careful perusal of these press releases has revealed the following information.

The recent ITU Plenipotentiary Conference, held in Nice during May and June 1989, decided that the first possibility of convening a WARC would be in 1992, probably in Spain.

The agenda for this 1992 Conference will be established by the Administrative Council, taking into consideration the resolutions and recommendations from WARC HFBC-87, WARC MOB-87, and WARC ORB-88. In addition, this Conference may consider defining new space services in frequency bands above 20GHz.

The Conference is expected to look at:

2 - 30MHz for additional allocations to the broadcasting service;

0.5 - 3.0GHz for allocation to the land mobile service, the mobile-satellite service, the direct broadcasting-satellite service, the space research service, and the space operations service; and

11.7 - 23.0GHz for allocation to the broadcasting satellite service for high definition television.

The following amateur bands will most likely be involved:

3.5MHz band which, in Region 2, has broadcasting footnoted into the top 50kHz. Broadcasting is also adjacent to the top of the band in Region 3;

7MHz band, which is the most critical as far as the amateur service is concerned due to the differences in regional allocations and the known desires of the broadcasters;

21MHz band because there is a broadcasting allocation on the immediate upper band edge; and 1260MHz.

The final agenda, the length of the Conference (possibly 4 weeks), and the venue wil be set by the ITU Administrative Council probably early in 1990.

Also of importance to the amateurs in Region 3 is a Regional Administrative Radio Conference to establish criteria for the shared use of the VHF and UHF bands allocated to Mobile, Broadcasting and Fixed Services; and, if necessary, planning for the Broadcasting Service in all or part of Region 3 and countries concerned in Region 1 (date and duration to be determined by the Administrative Council after consultation with members concerned).

The reason for the importance of this conference is because the amateur service shares many of its frequency allocations on VHF and UHF. The demands for access to frequencies in this part of the spectrum have also increased greatly since WARC79.

AMATEUR RADIO NOW THE PRIMARY SERVICE ON 2 OF THE WARC BANDS

Further to the news item on page 7 of June 1989 issue of Amateur Radio, the Department of Transport and Communications have advised the WIA that, as a result of band clearances which were agreed at the WARC in 1979, and which came into effect as from 1st July 1989, there has been a change in status of the Amateur Service from that of a secondary service to the primary service in the bands 18.068 - 18.168 MHz and 24.890 - 24.990 MHz.

This means that the footnotes to the bandplans for those frequencies, relating to avoidance of operation within +/- 4 kHz of 18.075, 18.105, 18.125, 18.130, 18.145, 18.147, 18.160, 24.900, and 24.9014 MHz, no longer apply.

INTRUDER WATCH REPORTS

The appointment of Gordon Loveday, VK4KAL, as the new Federal Intruder Watch Co-ordinator, was ratified at the meeting of the Executive of the WIA on Tuesday, 17th July 1989.

The Intruder Watch service, or as it is more commonly known overseas, the International Amateur Radio Union Monitoring Service (IARUMS), is a very important function of organised amateur radio in the fight for protection of our frequencies.

Intruder watching is not an activity for the "sprinter", but more for the "marathon runner". Monitoring the amateur bands for unauthorised intruders, which are those transmissions emanating from Governmental, Commercial or Military sources, is a time consuming and precise task.

If the Authorities are to be convinced that intruders are in fact causing harmful interference to the Amateur Service, then they are not going to be convinced by the occasional report.

The Australian Intruder Watch service needs a multitude of reports if we are going to have any success against the many intruders on the HF bands.

Individual intruder watchers should send their regular monthly reports to their Divisional Intruder Watch Co-ordinator.

Divisional Co-ordinators must send their monthly reports to reach the Federal Intruder Watch Co-ordinator during the first week of the following month. And these State reports should now be sent to Gordon Loveday, VK4KAL, "Aviemore", Rubyvale, Queensland, 4702.

STOLEN EQUIPMENT

The rash of stolen amateur radio equipment continues. The latest victim is VK5EZ, L E Hauber of Glengowrie, South Australia whose YAESU FT101E HF transceiver, serial number 7K301042 was stolen on the 8th of July this year.

This item has now been entered into the WIA Stolen Equipment register. It is of some concern to note the steadily increasing number of stolen items being added to this register, and the very few recoveries.

MUTIPLE CALL SIGNS

During recent discussions with DoTC in relation to obtaining callsign information for the 1990 Australian Radio Amateur Call Book, it came to my attention the number of amateurs who hold more than one station licence and callsign.

Apparently, for a variety of reasons, an increasing number of amateurs like to retain their Novice or Limited callsign when they upgrade their licence. DoTC told me they have no restrictions on the number of callsigns that an amateur may hold, provided the licence fee is paid for each station licence.

A quick check of our own records showed one amateur who currently holds no less than 8 separate station licences and callsigns!

CALLSIGNS OF DECEASED AMATEURS

Another point clarified with DoTC during my visit was that the policy of DoTC in relation to the re-issue of the callsign of a deceased amateur has not changed.

The callsign of a deceased amateur is not re-issued for a minimum period of 2 years after the date of death, unless under special circumstances such as the written permission of the next of kin to re-issue the callsign to a particular person.

Because of some difficulties with the SMIS computer system now used by the Licencing section of DoTC, the last Call Book included the names and callsigns of many deceased amateurs, but with the address being shown as the local DoTC office.

The callsign listings to be provided by DoTC for the 1990 Call Book should resolve this problem by excluding all deceased amateurs' callsigns.

WIA AWARDS CERTIFICATES

The Federal Awards manager recently advised the Executive that the cost of Award certificates to non-members of the WIA has remained at $US2.00 for at least the last 6 years. Ken pointed out that, because of inflation, that amount no longer covers the cost of post and packing overseas, let alone the cost of the certificate itself. At the Executive meeting on 18th July 1989, Executive ratified the Awards Manager's recommendations for new fees as follows: $US5.00 for those applicants outside Australia
$A5.00 for non-WIA member applicants within Australia; and
FREE to all WIA members.

BACK ISSUES OF AMATEUR RADIO MAGAZINE

The Executive Office is clearing out its stocks of back issues of Amateur Radio magazine. If you need to complete your files of AR, this may well be your last chance.

Our stocks range from the January 1969 issue through to the December 1987 issue, and most issues in that period are currently in stock. Back issues of your choice are available at $2.50 each, which includes packing and postage anywhere in Australia, or you can receive 10 back issues of our choice for $17.50, which also includes packing and postage.

These copies of Amateur Radio include articles on antennas, power supplies, equipment reviews, etc., and make excellent reading. This is a limited offer, so don't miss out. It may well be your last chance to obtain these magazines.

Write to Amateur Radio Back Issues, PO Box 300, Caulfield South, 3162, Victoria with your order and remittance.

ARRL 40 METRE DXCC AWARD

The ARRL has just announced the recipients of the first 20 certificates issued for the newly created 40 Metre DXCC Award. Congratulations are in order to VK6HK who shares certificate number 11 with JA8EAT and SM0AJU with a total of 301 countries confirmed.

NEW PREFIX IN THE PACIFIC

From a recent ARRL Newsletter we learn that the ITU has allocated the call prefix V6 to the Federated States of Micronesia which were formerly one of the users of the KC6 prefix. Amateur stations will use callsigns from V63AA to V63ZZ.

The call prefix V7 has been allocated to the Republic of the Marshall Islands (formerly KX6). Amateurs will use call signs from V73AA to V73ZZ.

CLUBS WIA MEMBERSHIP PERCENTAGE

My comments in July issue of Amateur Radio about the percentage of club members who are also members of the WIA has evoked some response. In the July edition of their Monthly Newsletter, the Westlakes Amateur Radio Club state that because they actively encourage club members to join the WIA, or perhaps because club members see first-hand a tangible benefit of belonging to the WIA through the operation of the VK2 QSL Bureau, their club WIA membership to non-WIA membership is 68%.

Peter, VK6BWI, also contacted us and advised that the CW Operators QRP Club, with a current membership of 130, has a WIA membership to non-WIA membership ratio of around 80%! As Peter states, this is a very high figure, especially so for a club which has yet to affiliate with the WIA.

Peter also made the interesting observation that 68% of the VK contacts entered in his log are WIA members. He believes that the WIA could claim to have two thirds of the active amateurs in Australia as members.

Continued on page 49

Opening Address

Remembrance Day Contest 1989

W R Gronow - VK3WG, RAAF (Retd)
ex Federal President WIA
ex State President Victorian
Division WIA
President RAOTC

I count it a privilege to be given the opportunity of delivering the opening address to the Remembrance Day Contest, 1989, which is held to perpetuate those Australian Radio Amateurs who paid the supreme sacrifice in the service of their country.

During my years of service as a member of the Royal Australian Air Force, I had the opportunity to come into contact with many of my fellow Radio Amateurs who served in the Signals and Radar elements of the RAAF and allied Services.

These comrades won my appreciation for their devotion to duty and the self sacrifice they exhibited in the service of their country in time of war.

It would be fitting to remind you of the RAAF Wireless Reserve which was initiated by the Wireless Institute of Australia and whose members provided a most valuable addition to the Directorate of Signals of the RAAF. Similarly reservists in the Navy and Army provided a trained and readily available compliment of loyal and devoted executives, radio engineers, maintenance mechanics and operators for their respective branch of the Service.

The Radio Amateur is noted not only for his keen interest in the technical aspects of radio communications, but for his fraternal attitude to other Radio Amateurs throughout the world. This friendly attitude was demonstrated to a high degree in the Armed Services during World War 2, where radio amateurs and their service colleagues worked together so harmoniously.

Because of their devotion to, and interest in, radio, it is pleasing to note that many members of the services became licensed amateurs when hostilities ceased.

My wartime service brought me into contact with radio amateurs of all the armed services - Navy, Army and Air Force, and I remember the lasting friendships thus formed between the three groups as we worked together for a common purpose.

It is indeed fitting that we radio amateurs should remember with gratitude the sacrifice of those of our comrades who gave their lives and also those who were wounded as a result of their war service. Many of our comrades still suffer as casualties from their war injuries, and therefore deserve our appreciation and thanks for their devotion to duty. Of course we should also remember the tragic loss experienced by the widows and children of those who gave their lives on active service, for they too paid a heavy price. It is certain that we could do no less than remember with respect and affection, all such, especially those who gave their lives for the Commonwealth and whose loyalty and devotion to duty, we now celebrate in this the 1989 Remembrance Day Contest, which I now have pleasure in declaring open. ar

A Brief Autobiography

William Rees Gronow
VK3WG

About 1855 two young Welshmen came to Victoria to try their luck at the Ballarat goldfields. There they each met and married two young Welsh girls at the Welsh Church in Ballarat. Each family was eventually related, when my father and mother married in 1897 at Williamstown, where I was born on 30 March 1908. At the age of two years we came to live at South Melbourne, where I attended the local state school, later transferring to Scotch College at East Melbourne. On leaving school I joined the staff of Buckley & Nunn, the well-known Bourke Street drapers, where I gained a sound practical commercial training.

When I was about thirteen, I became interested in wireless communication and built a crystal receiver, to listen to ship shore and later phone transmissions from AWA's experimental station in Little Collins Street, Melbourne. Shortly after this period, I passed the required morse test, to obtain my official receiving license V574, which was issued in 1921. It was about this time that I built my first valve receiver and later in 1925, I obtained my AOCP - No 178.

When I was about twenty, we, as a family went abroad for an extended world tour and I then met many Canadian, American, English, and Continental Amateurs and these contacts furthered my knowledge of radio, and on the grinding of quartz crystals in which I became very interested. After leaving Buckley & Nunn, I joined my father as a director in several softgoods businesses, which he operated in the city of Melbourne.

I was an active member of the Council of the Victorian Division of the WIA and participated in the organising of the several annual exhibitions, which introduced radio to the general public. Also I was jointly instrumental in promoting the WIA journal Amateur Radio, and setting up the Disposal Equipment distribution of war time surplus equipment to WIA members.

During this period, I became Federal President and State President of the WIA several times and I am currently the President of the RAOTC and a life member of the WIA. I was also on the Council of the Royal Flying Doctor Service (Vic Div), and I became the convenor of its Federal Radio Committee.

When we returned from abroad, I set up my amateur station as A3WG at our home on St Kilda Road, opposite the Shrine of Remembrance. This call was later changed to OA3WG and was later transferred to Malvern as VK3WG, after I was married in 1934. It was during the depression years that I changed my occupation to the electrical engineering profession, when I joined Warburton Franki handling electrical products, General Radio and Weston Instruments.

I continued my WIA activities by setting up the WIA station at Essendon, in conjunction with the Aero Club and also I built and installed the radio equipment for the Mackay Central Australian aerial expedition for which Howard Love was the operator.

After leaving Warburton Franki, I enlisted in the RAAF in early 1940 and became an officer in the Directorate of Signals RAAF HQ, where I was engaged in the engineering design of automatic petrol and diesel engine power supplies, and the location and construction and transmitting, receiving and DF stations and their aerial systems. My service covered a period of

Continued on page 9

The Unique Pedal Wireless

Mervyn Eunson VK4SO
Box 1513 GPO
Brisbane 4001

Restoring Traeger radio sets of the Flying Doctor Service reveals that each design is that of a genius.

One on the bench is typical, a multi-channel 50w PEP sideband transceiver from the sixties. The 12-volt power supply is a solid-state toroid inverter for the QZ06/20 final, and all transistors in receiver and oscillator are of the one type, BF195. The built-in adjustable antenna loading coil resembles nothing so much as a large rotary potentiometer. Simplicity allied with efficiency is the keynote.

But the favourites always will be the older CW sets. Of these, the portable "pedal wireless" takes the prize as an improved version of the initial basic homestead set. This portable is a modified design for roadside use by the roving patrol padres of Flynn's ministry, who sixty years ago travelled the scattered outback on horse or camel.

The unit is in two wooden cases of solid timber, stoutly dovetailed for strength and rebated for dustproofing. Construction of the cases is a masterpiece of the cabinet-maker's art.

One of the cases contains the pedal generator to supply high-tension direct-current of 180v for the lone transmitter valve: other compartments held two large 1.5v dry cells for filament supply and 45v B-batteries for the receiver. The other case, of identical size, contains the radio, with both transmitter and receiver on the one chassis.

For operation, both boxes are stacked together, with a wire for an aerial thrown out and the morse key plugged in. The open lid made a convenient place to hang the hat, doffed to don earphones. Afterwards, a thick leather strap was strung through recessed brass handles, when the two cases became a balanced load slung across horse or camel for transport.

An end-fed quarter-wavelength wire, worked against earth, could form the aerial. But the poor conductivity of inland deserts often dictated the use of a counterpoise instead of an earth connection.

Delving into the compact innards is a treat. The single-stage transmitter is a modified Pierce oscillator having tuned output on 2020 kHz. The open slab crystal is protected in a handsome screw-in cylinder of brass. A Philips' PH-233 pentode valve

CW From A Gulf Outpost. While quality is poor, this is the most valuable historical print in existence - operator is padre "Skipper" Partridge 8XP in 1931.

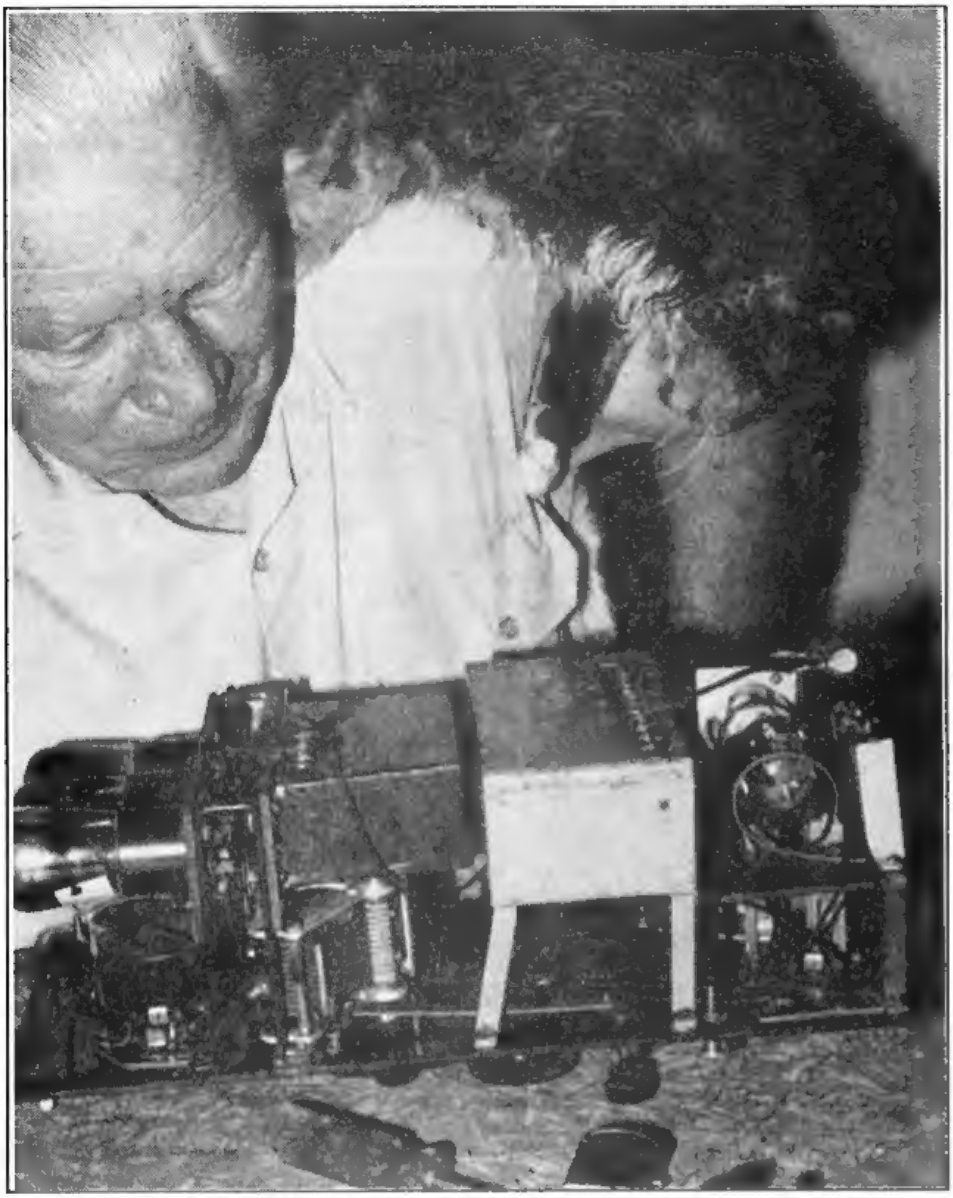
is used, with the feedback for oscillation adjusted by a "gimmick" capacitor - a 2 inch halo loop of wire coupled by proximity to the plate. The generator delivers 50 mA of current, sufficient to provide 20 mA for the plate and the requirements of screen and its own field coil without undue loading.

All tank circuit components are built into 4-inch plug-in former, fitting flush with the panel, including the exciter crystal and the tuning capacitor. There is also the output indicator, simply a torch globe in series with the rf coil (aerial current is less than 200 mA). And without any sidetone facility, the blinking of this lamp became the means of monitoring transmissions.

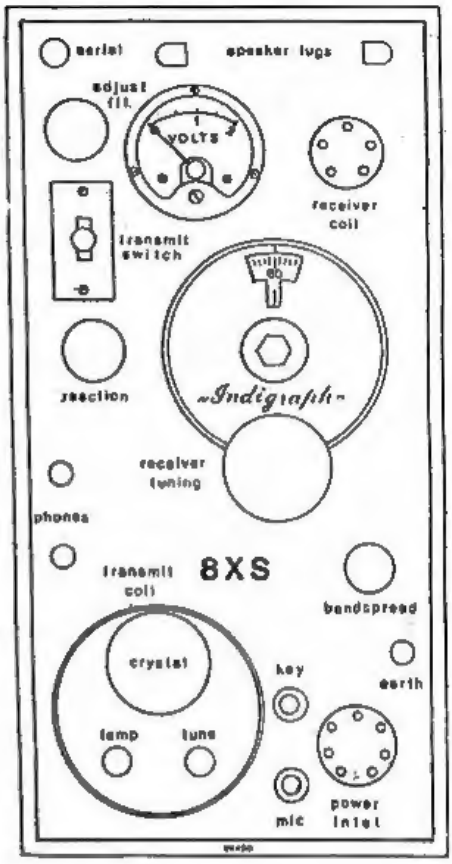
Output power of the oscillator/transmitter is less than 1.5 watts! And this proved adequate with the efficiency of CW. High-power boys may gasp, but upon this mere dribble (undeniably better than nothing) pioneer people staked their lives - notwithstanding the tropical QRN on 148 metres. Even vibrator-type models post-war boasted no greater than 3 watts of AM, stepped up to a heady 10 watts by the end of the modern fifties.

The receiver section of this model is equally stark, but superior to the little homestead 2-valve set that had 9v of high-tension. For here a 3-stage reaction circuit is employed with interstage coupling by means of 2:1 audio transformers. Three Philips A-109 triodes with 1.3v filaments are used, having a gain factor of 9. Evidently chosen for efficiency, plate current of each is a meagre 3 mA at 45v, which allowed over a hundred hours of operation from one set of B-batteries. Negative grid bias is obtained without C-type batteries by using cathode resistors.

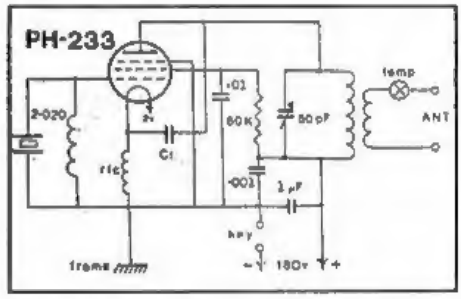
With large cylindrical No 9 size A-cells of 1.5v for heater current, a panel meter allows precise adjustment of filament voltage with a 1.5 ohm rheostat. This performs another function, for there is no volume control or af gain adjustment: in the event of excessive gain, the rheostat may be backed off to reduce emission. An uncommon problem perhaps, for the output stage



H'mm, a new catswhisker! An internal view of the works (That is a cat on Mervyn's shoulder)



Layout of the Panel



The Oscillator/Transmitter

develops 135 milliwatts of audio with full drive.

The receiver is fully tuneable with a variable capacitor attached to a 4:1 "Indigraph" reduction drive: a separate adjustable vane allows generous bandspread. The Marquis plug-in coil covers the upper portion of the broadcast band (for news and weather reports) and tunes up to 2020 kHz, the network frequency of VJI at Cloncurry Base. Due to the "slope detection" function of the regenerative stage, the set resolved outback CW as well as the AM of base and broadcast stations (it also resolves today's sideband transmissions).

High-impedance headphones match to the plate resistance of the output valve. As well, in the lid is a magnificent free-edge loudspeaker of 5000 ohms impedance with the cone mounted face down, seemingly upside about. Its driver, fitted underneath the cone, is a balanced armature inductor unit with a driving rod on which the cone is suspended (superior technology long since gone). Although found to work flawlessly, curiosity caused it to be compared to a modern speaker coupled via a 5K:15-ohm output transformer. The old warrior was found to yield not one jot in terms of sensitivity or fidelity!

While designed primarily for CW transmissions, a microphone socket is provided for limited AM operation. There is no modulator valve, for with this low level of power, it is feasible to modulate the plate directly with a transformer secondary inserted in the high-tension supply line: the primary is coupled to a carbon microphone.

Probing this marvellous set for restoration appeared daunting, for all coupling transformers and cathode resistors are sealed in metal containers filled with pitch for tropic-proofing. It might seem this would complicate servicing, but then apart from regular battery and valve replacements, none would have been necessary. The device was made to last, with all components rated generously, such as a 1500v oil-filled filter capacitor and a 10 watt "Radiokes Maxsome" screen resistor.

After restoration, the set functioned well on test into a non-radiating dummy load. As the fixed channel of 2020 kHz remains a Flying Doctor frequency for emergency

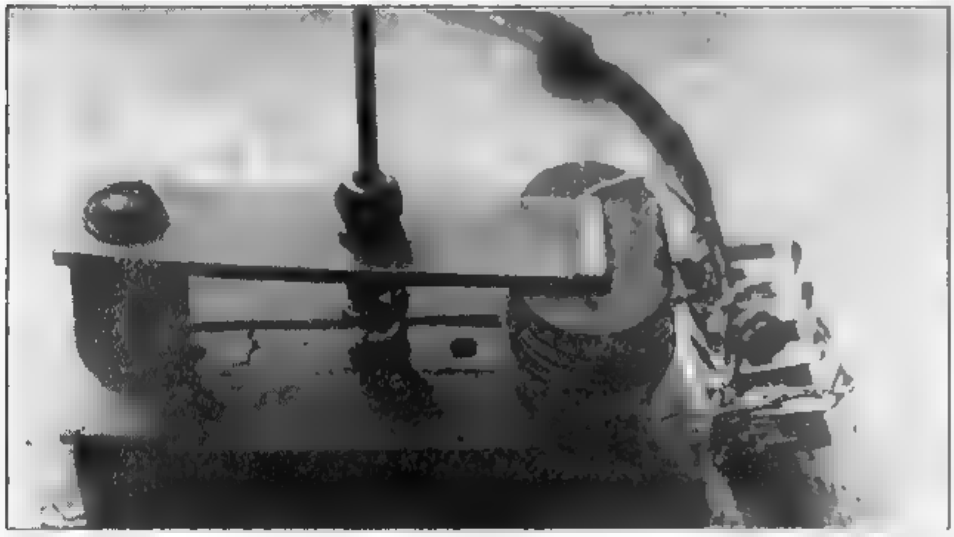
traffic, a modified plug-in coil was wound to suit a crystal on 3540 kHz: this enabled CW operation by working QRP on the amateur 80m band A kitchen chair was found too high for consistent pedalling, solved by taking a case of essential anti-dehydration supplies from the galley. Then a little practice was required to co-ordinate pedalling the generator with keying the rig (the morse obtained a nice rhythm, reports said).

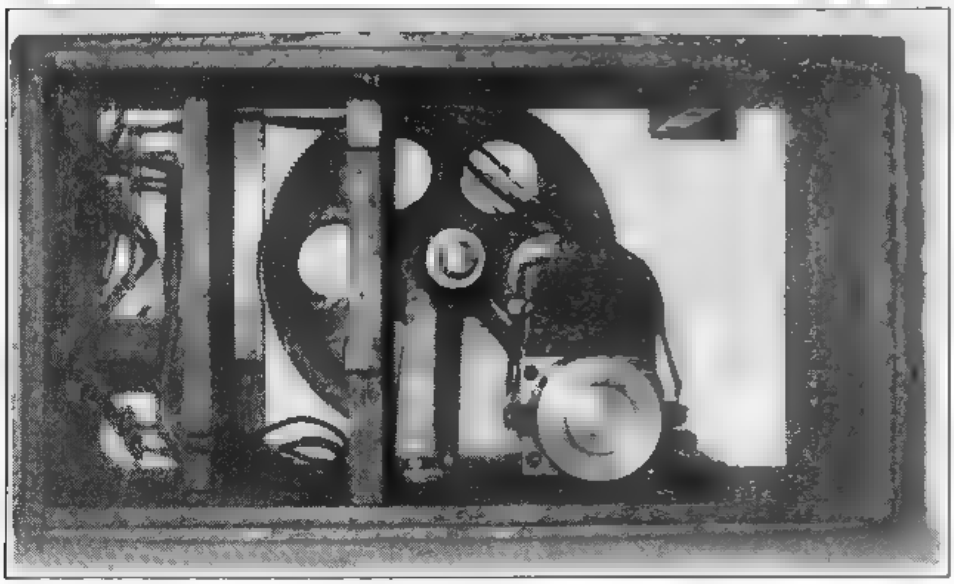
The individual history of this particular set shows that it was licensed in Adelaide late 1933 to the AIM or Australian Inland Mission (as the Flying Doctor Service then was known), and allotted the call-sign 8XS, for use by a patrol padre, the Rev Patterson. The prefix "8" shows that it was a portable station, and the "X" denotes an experimental licence.

One salutes the ingenuity of its amateur designer, Alfred Hermann Traeger, VK5AX. He confounded the experts, who decreed, "it just can't be done"! ar

Padre using phone and dipole. (Rev Fred McKay 1933)

(Below) Loud speaker driver





Interior of Powerpack

Continued from page 6.

A Brief Autobiography

William Rees Gronow
VK3WG

nearly six years and for the last two or three of the war, I was responsible for the installation and maintenance of Signals equipment in boats, vehicles and aircraft.

The final years of service found me in charge of technical development and production of Signals and Radar equipment in Australia, a great deal of my time being give to tropicalisation problems.

When I retired from the RAAF, I worked with several prominent firms in the Radio field, in engineering and sales promotion, eventually setting up my own business, as Zephyr Products with which company I am currently the Chairman of Directors

I am happy to say that I am still maintaining my life long interest in Amateur Radio.

ar

Output Impedance - Source Impedance - Load Impedance

Lloyd Butler VK5BR
18 Ottawa Ave
Panorama 5041

The relationship between source resistance of an amplifier and its operational load resistance is often not well understood. Using valve and transistor characteristic curves, this relationship is examined.

Introduction

Output impedance is a term commonly used by manufacturers in the specification of the output circuit in electronic equipment such as amplifiers and transmitters. What they usually mean is that this is the load impedance into which the equipment is designed to operate. There seems to be a lot of confusion about the term output impedance as it is often taken to mean, and often meant to mean, the source impedance of the equipment. In precision test equipment, the design is such that the source impedance is made equal to the load impedance into which it is meant to operate. However, in other equipment, the source impedance is usually quite different from the load impedance used and it seems that this is not always appreciated.

In the following paragraphs, we will examine the characteristics which define source resistance and load resistance for valve and transistor power amplifiers. Hopefully, we might be able to clear up a few questions, often misrepresented concerning amplifier output circuits. In the discussion which follows, the word resistance will sometimes be substituted for impedance in the explanations which are given. For the purposes of the discussion, the impedances will be considered as resistive. To eliminate confusion, the term output impedance will also be avoided.

Matching

The idea of matching load impedance to source impedance stems from a principle shown in figure 1 in which a generator supplies power to its load (R1) via its own internal or source resistance (Rs). If we commence with R1 greater than Rs, more power will be dissipated in R1 than in Rs. As we decrease R1, the power in both R1 and Rs will increase up to the point where R1 = Rs and equal power will be dissipated in each. Decreasing R1 further increases the power lost in Rs but the power in R1 is decreased. Clearly, maximum possible power is dissipated in R1 when R1 = Rs.

The problem with this matching system of R1 = Rs is that half the power is lost in the source. Imagine a power supply authority tolerating a system in which half the power they generate is lost in their own generating machines. The best system, from their point of view, is one in which Rs is the lowest. In the valve or transistor amplifier, the problem is not quite the same and this will be discussed further on.

A concern with matching in amateur radio is the prevention of signal reflections on our transmission lines. Reflections occur on a transmission line if the line is not terminated in a resistance equal to its characteristic impedance, or if an impedance discontinuity occurs along the path of the line. Reflections on the line cause standing waves which increase line loss and in the case of pulse or video type signals, degrade the quality of the signals.

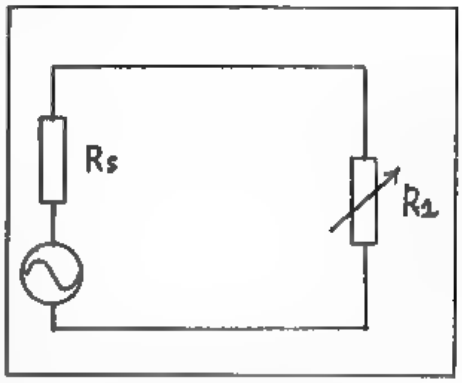


Fig 1. Impedance matching

Let us now consider the source impedance of the transmitter feeding the transmission line. If there are reflections on the line, the reflected signals are returned to the source. If the source impedance is equal to the line impedance, the reflected

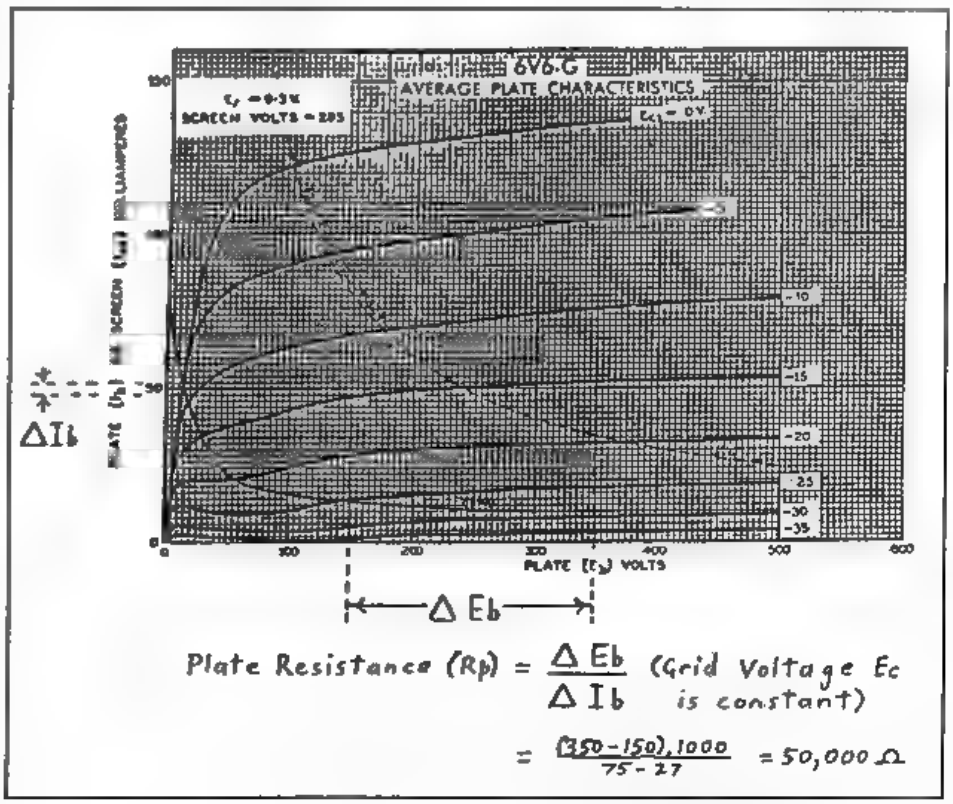


Fig 2. Ib versus Eb curves for a tetrode and the derivation of plate resistance

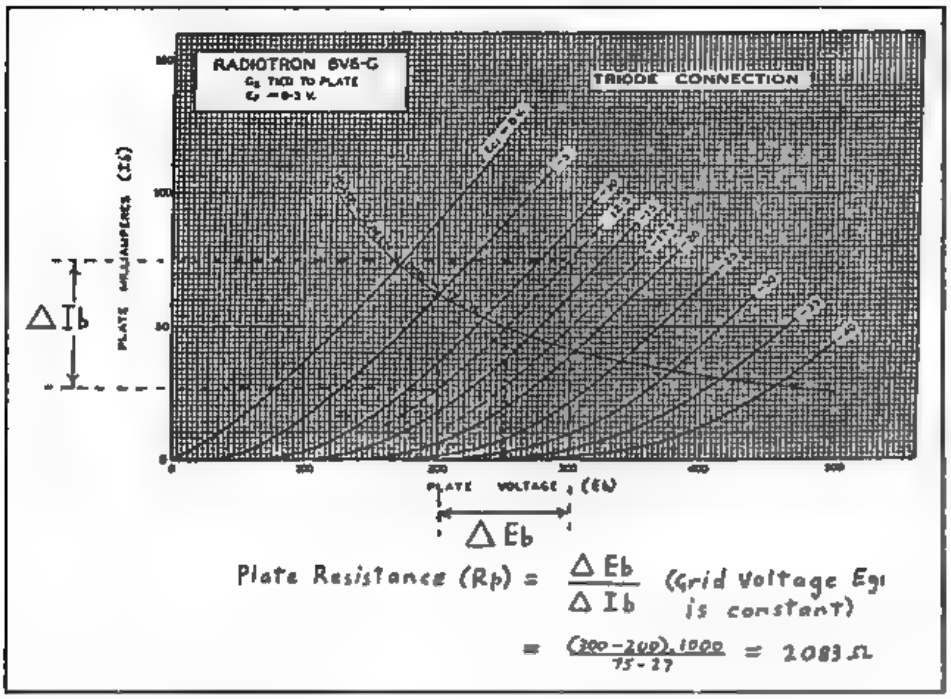


Fig 3. Ib versus Eb curves for a triode and the derivation of plate resistance

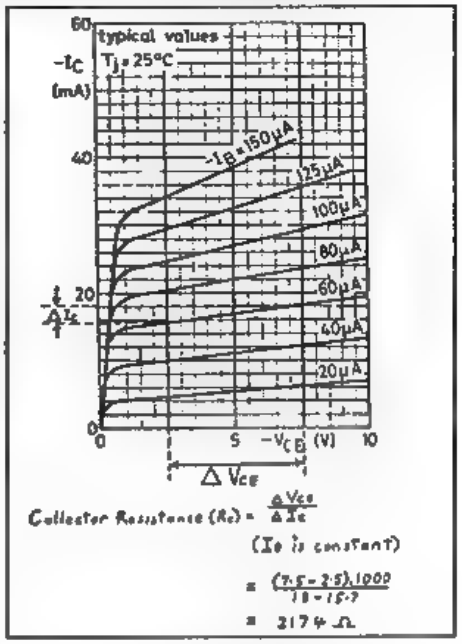


Fig 4. Ic versus VCe curves for a transistor and the derivation of collector resistance

signals will be absorbed by the source. On the other hand, if there is a mismatch here, the reflected signals will be further reflected back down the line to aggravate the standing wave condition. So here is a good reason for the source impedance to be matched to the transmission line impedance.

Suppose we have a transmission line which is correctly matched and has no reflections on the line, or alternatively, there are standing waves but these are made invisible to the transmitter by inserting a matching network or aerial tuner between the transmitter and the line. In this case, there is no reflected signal to be absorbed or re-reflected and as far as standing waves are concerned, it does not matter one iota what source impedance is seen in the transmitter. With this considered, perhaps the source impedance of the transmitter is not so important after all. Our main concern is that the specified load impedance (usually 50 ohms resistive) is reflected across the transmitter output from the transmission line load.

In the paragraphs which follow, source resistance and load resistance will be examined using valve and transistor characteristic curves to show how these two parameters are likely to be widely mismatched. To demonstrate the arguments which will be submitted, the amplifiers will be considered to operate essentially in Class A as this class of operation is more straight-forward to analyse than classes which utilise plate or collector current flow over less than the full AC cycle.

Source Resistance

Source resistance of an amplifier is equal to the AC plate resistance (or collector resistance in the case of the transistor) divided by the impedance ratio of the output coupling circuit. For simplification of the discussion, impedance ratio of the output circuit will be taken as 1:1.

The plate resistance (Rp), at a given grid voltage (Ec), is the reciprocal of the slope of the plate current (Ib) versus plate voltage (Eb) curve. On the curves of figures 2 and 3, it is derived by taking the ratio of a change in Ib to a change in Eb for a constant Ec. In the beam tetrode case of figure 2, grid voltage (Ec) is set at -15V and plate resistance is derived as 50,000 ohms. In the triode example of figure 3, grid voltage is set at -12.5V and plate resistance is derived as 2,083 ohms. Observe the difference in slope between the tetrode and triode curves and the resultant much higher plate resistance of the tetrode than that of the triode.

In the transistor example (figure 4), collector resistance (Rc) is the ratio of a change in collector/emitter voltage (Vce) to a change in collector curent (Ic) for a constant base current (Ib). For a base current of 60 micro-amps, Rc is derived as 2,174 ohms.

Load Resistance

The reflected load resistance (R1) to the valve amplifier can be represented by drawing a load line on the Ib versus Eb curves (refer figures 5 and 6). The load line represents the swing of plate voltage and plate current under operational or dynamic conditions. Its slope is equal to -1/R1, where R1 is the load resistance, or the ratio of a change in Eb to a change in Ib read along the load line in reversed sign.

The valve characteristic curves are far from perfect and the load line is set for a compromise which achieves as high as possible maximum power output consistent with an acceptable level of distortion. The load line must also lie within the limits of the maximum power dissipation curve. For the tetrode case shown in figure 5, the optimum load resistance is around 5,000 ohms.

Referring back to the derivation of plate resistance, we see that at 50,000 ohms, the plate resistance is ten times the load resistance. The plate resistance is seen by the load as the source resistance which, for the tetrode, is typically much higher than the load resistance.

Figure 6 shows a load line selected for the triode connected amplifier. In this case, the load resistance is 3,889 ohms and different from the tetrode, is higher than the plate resistance which was derived as 2,083 ohms. For the triode case, the source resistance at the amplifier output is typically lower than the load resistance

Finally, figure 7 shows a load line drawn for the transistor. With the operating point set for a supply voltage (Vcc) = 5V and a base current (Ib) = 60 micro-amps, the line is drawn from the X axis, at a value of Vce equal to twice Vcc, through the operating point, to the Y axis scaled Ib. The load resistance is equal to the ratio of a change

in Vc to a change in Ic, read along the load line in reversed sign. The load resistance is derived as 294 ohms and much like the tetrode, is a much lower value of resistance than that derived for the collector resistance, or source resistance, of 2,174 ohms.

The examples illustrate the general relationship between source resistance and load resistance in valve and transistor power amplifiers. For tetrode valve and transistor amplifiers, the source resistance is very much higher than the load resistance. The pentode valve is also much the same as the tetrode in this respect.

The triode valve is different. For this amplifier, the source resistance is normally lower than the load resistance. For class A triode power amplifiers, the load resistance usually works out to be around two to three times the plate resistance.

Efficiency

The amplifier stage is often depicted using the analogy of figure 1, of an AC generator in series with its own plate or collector resistance, connected to the load. This is a very useful analogy to calculate such factors as stage gain, but if we use it to calculate efficiency, the analogy fails. When we apply it to the tetrode or pentode valve or the transistor amplifier, each of which have high AC source resistance compared to the load resistance used, we see a condition in which most of the power generated appears to be lost within the source resistance of the amplifier. This condition is not true.

It can be shown that, for an amplifier with ideal characteristic curves, maximum efficiency class A is 50% and maximum efficiency class B is 78%. The transistor efficiency closely approaches these values, limited essentially by the bends in the curves at low collector voltage and which are clearly seen in figures 4 and 7. To illustrate the class A case, we will pretend the bends in the curves are not there as shown in figure 8. DC power is given by the product of collector supply voltage (Vcc) and the average collector current (Icc), ie

Pdc = Vcc Icc

Maximum AC voltage swing is twice Vcc and maximum AC current swing is twice Icc. To get RMS values we divide both of these by 2 root 2 and the product of the two results is AC power, ie

$$Pac = \frac{2Vcc.2Ic}{(2\sqrt{2}).(2\sqrt{2})} = (4Vcc.Icc)/8 = (Vcc.Icc)/2$$

The AC power is clearly half the DC power and the maximum efficiency is 50%. It should be observed that this calculation is unaffected by the slope of the Ic versus Vc curves, and hence, unaffected by the high

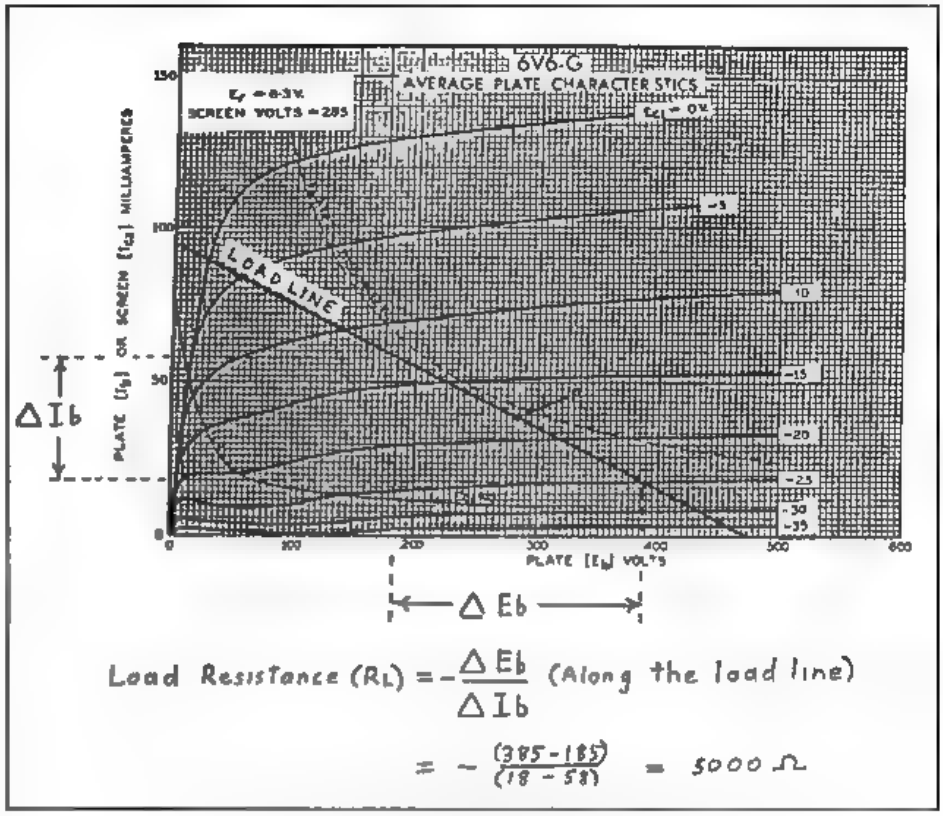


Fig 5. Load line and load resistance of a tetrode valve.

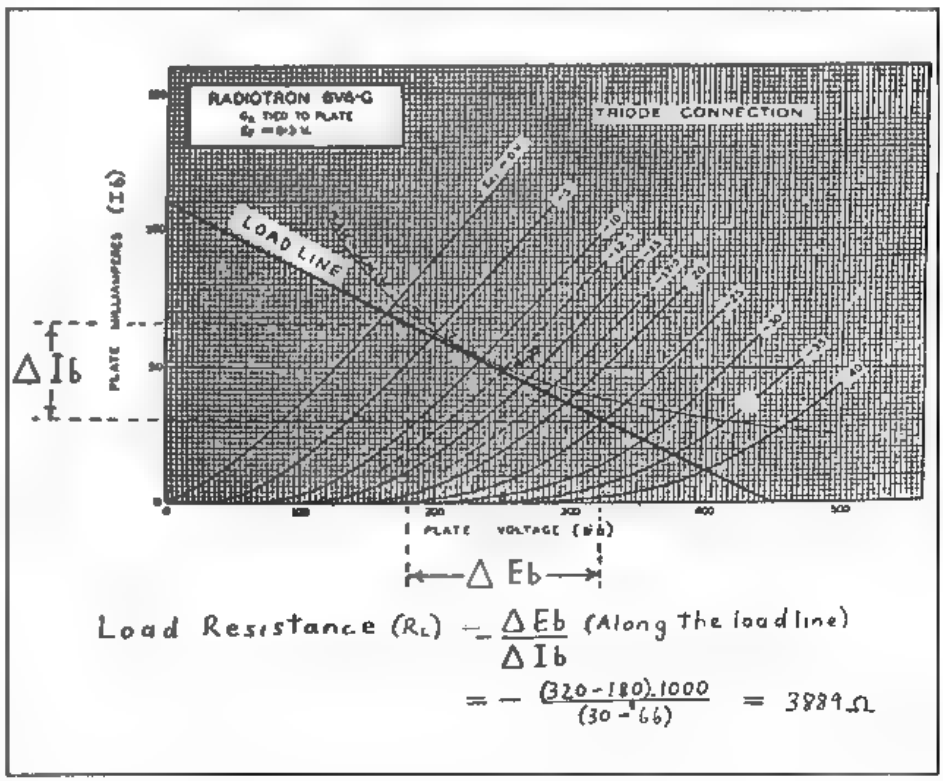


Fig 6. Load line and load resistance of a triode valve.

value of collector resistance. For our amplifier, the circuit analogy of figure 1 cannot be used to calculate efficiency of the stage.

It is interesting to observe that, when Vc is maximum, Ic is minimum and when Vc is minimum, Ic is maximum. In other words, the AC current swing is 180 degrees out of phase with the AC voltage swing. This is exactly opposite to power consumed in a resistance and hence we can consider the amplifier as a negative resistance or a generator of power.

Maximum Power Output & Power Sensitivity

At this point we will examine the optimum value of load resistance. Maximum power output is achievable when the load line intersects the Vc axis at twice Vcc, as shown in figure 8 and as curve A in figure 9. If the load resistance is reduced so that we get curve B in figure 9, the voltage swing is limited to that shown by XX. If the load resistance is increased so that we get curve C, the current swing is limited to that shown by YY. In either case, the maximum power output is less than that achievable with curve A. All this leads to the well known formula:

$$\text{Load resistance (R1)} = \frac{Vcc^2}{2Po}$$

Where theoretical maximum power (Po)
= Power input/2
= (Vcc.Icc)/2

Maximum power output should not be confused with power sensitivity which is the ratio of power output to the input signal power to the base. It is equal to:

$$\frac{(\Delta Ic)^2 . RL}{(\Delta Ib)^2}$$ (along the load line)

or approximately $(Hfe)^2.RL$

where Hfe is the transistor current transfer ratio and collector resistance (Rc) is much greater than R1.

Power sensitivity is increased as R1 is increased but, of course, at the expense of lower maximum power output.

Although the amplifier generates AC power, it is not quite the same as an alternator source. It is really a direct current device in which the circuit DC resistance and hence the circuit current, is made to change by changing the input base current, or in a valve, the grid voltage. By feeding an AC signal to the input, an AC current component is superimposed on the direct current. The AC is separated from the summed result by capacitive or transformer coupling.

In other respects, the amplifier behaves like an AC source. The source resistance can be considered to be what a signal would see if fed backwards into the amplifier output. (For example, the reflected signal returned on a transmission line or the signal generated by resonance in a loudspeaker following an impulse or transient). In this case, the backwards signal voltage attempts to vary the amplifier current and in the transistor, the collector current tends to remain near constant resulting in a high reflected AC resistance.

As pointed out before, the analogy of figure 1 is not relevant to calculation of maximum power output or power efficiency but it certainly can be used in the derivation of stage gain and power sensitivity. An example of its use is the well known formula for stage gain in a triode valve amplifier:

$$\text{Stage gain (A)} = \frac{\mu R1}{R1+Rp}$$

where μ = amplification factor

Making use of figure 1, the generator voltage is equal to the AC input voltage multiplied by the amplification factor. Of course stage gain can also be directly read from curves such as those shown for the triode in figure 6. In this case, stage gain is

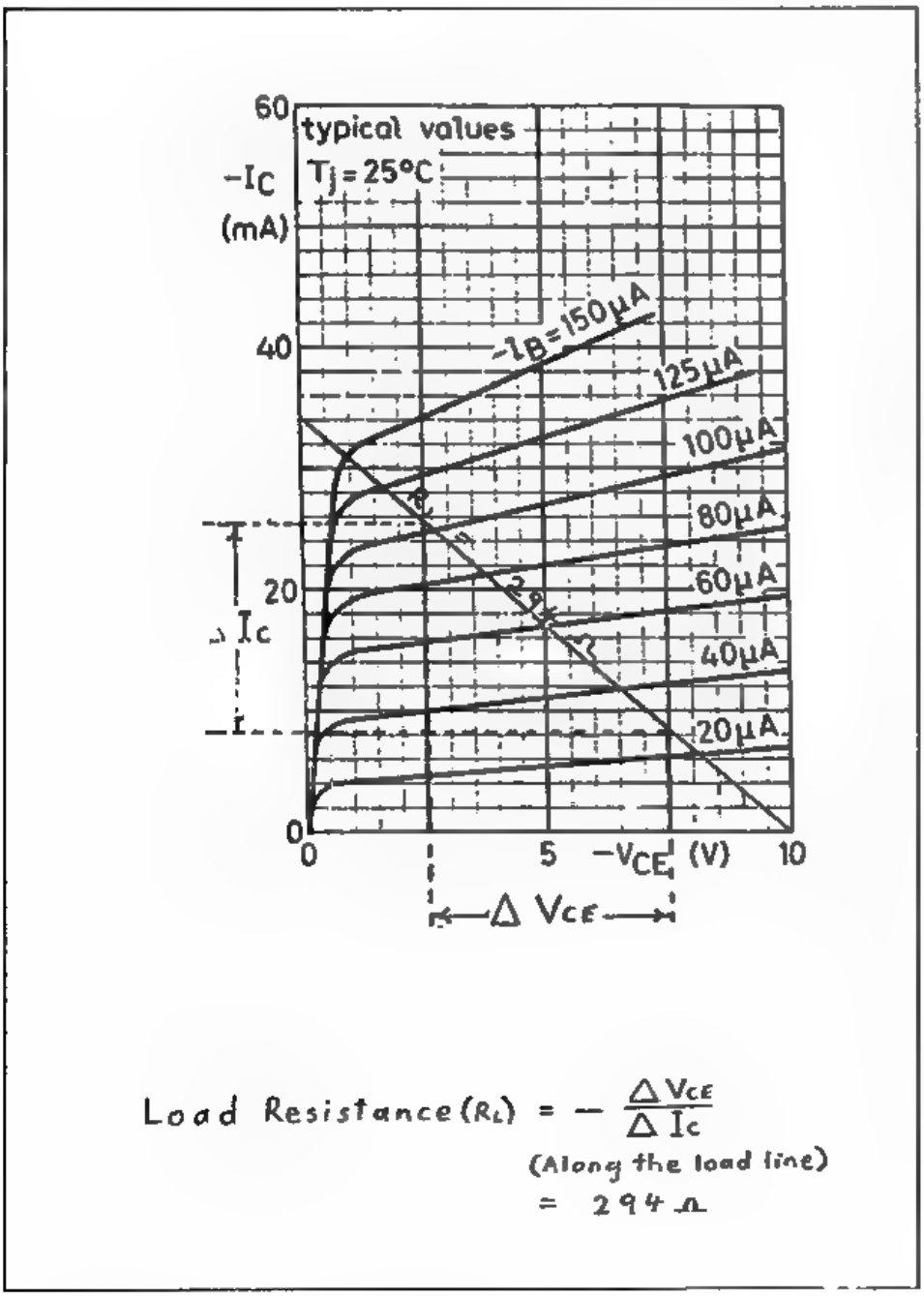


Fig 7 Load line and load resistance of a transistor

equal to the ratio of change in Eb to change in Ec read along the load line.

Negative Feedback

We have shown that source resistance in an amplifier can be quite different from the load resistance used, but often there is a need to change it so that it equals the load resistance or some other desired value. For example, in a moving coil loudspeaker there is a need for heavy damping to prevent the speaker cone resonating when a transient is delivered. This can be done, without loss of speaker efficiency, by feeding the speaker from a low resistance source which acts as an electrical load to damp out the resonance.

Negative feedback is commonly applied to amplifiers to reduce distortion and noise generated within the amplifier itself. It is also used to modify the amplifier source resistance. Negative feedback can be categorised into negative voltage feedback and negative current feedback.

Negative voltage feedback is defined as voltage fed back to the amplifier input in proportion to the voltage across the output load (refer figure 10). Negative current feedback is defined as voltage fed back to the amplifier input in proportion to the current through the output load (refer figure 11). Voltage feedback decreases the effective source resistance whilst current feedback increases it. By applying a controlled amount of voltage or current feedback (or a combination of both), the source resistance can be modified to a selected desired value.

Whilst negative feedback is common in audio frequency power amplifiers, it is difficult to apply where there are loads which become reactive at certain frequencies and cause sufficient phase shift to make the feedback positive and the amplifier unstable at these frequencies. Because of this, negative feedback is not a proposition in tuned RF amplifiers and in these, we must accept the inherent plate resistance or collector resistance to define source resistance.

Class B

Preceding examples of amplifiers have operated in class A, so we will extend the exercise to examine the relationship between source resistance and load resistance for class B In class B operation, the amplifier is biased for near plate current or collector current cut off and current flows for half of the AC cycle of signal output. The other half cycle is provided by a second amplifier to make a push-pull circuit, or in a tuned RF amplifier, can be provided by the inertia or flywheel effect of the tuned tank circuit.

Class B operation is discussed with reference to the transistor curves of figure 12. For zero signal, the collector voltage is equal to the supply voltage (Vcc of 7.5V) and collector current (Ic) is near zero. Maximum current swing on load line A is limited to the point where the load line intersects minimum collector voltage on the Ic versus Vce curves.

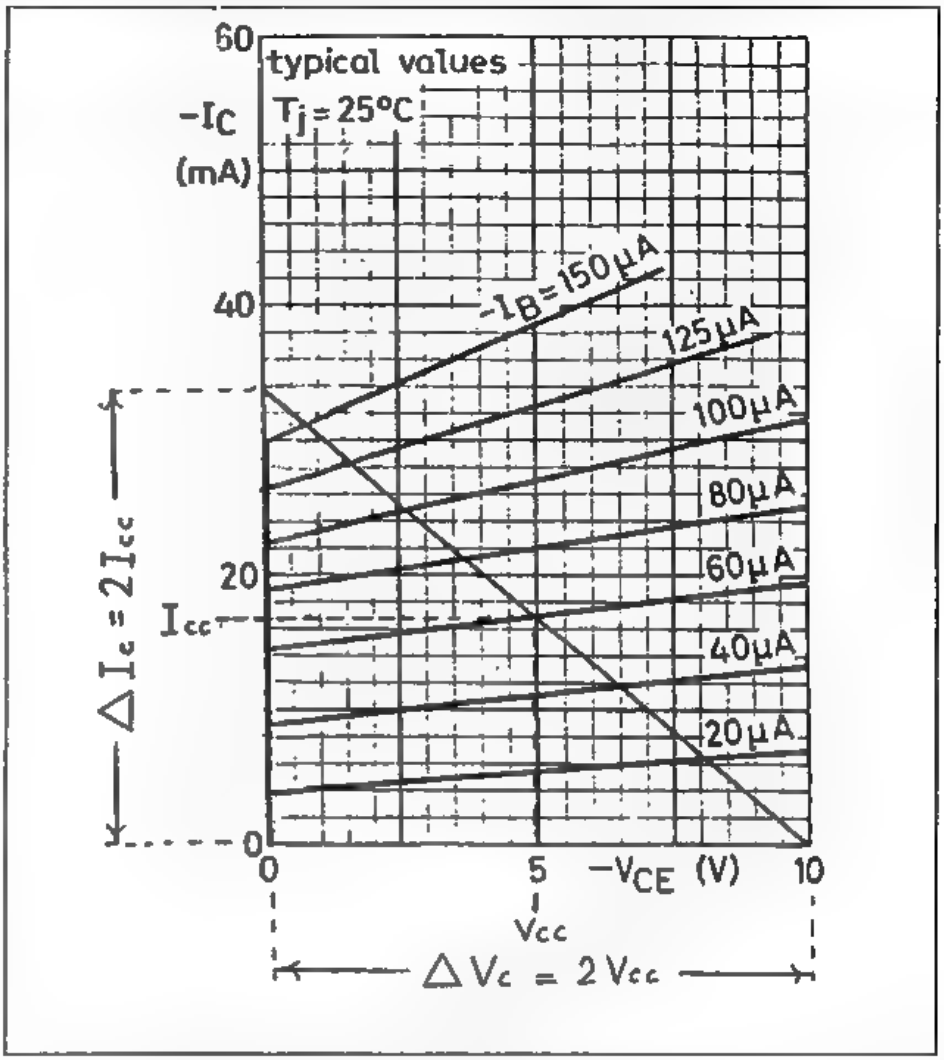


Fig 8 idealised transistor curves and maximum power output.

Maximum current swing and maximum power output can be increased by decreasing the value of load resistance (R1) as shown in load line B. Further decrease of load resistance (load line C) further increases the maximum current and maximum power output but the load line now crosses the maximum power dissipation curve set on the diagram for 100mW. Maximum power output is thus achieved with a load line which is drawn from a point at Vcc and Ic = 0 to just within the limits of the power dissipation curve.

As can be seen from the diagram, the absolute value of the negative going slope of a typical load line is much greater than the slope of the Ic versus Vce curves and hence, the value of load resistance is again much smaller than the value of collector resistance, probably even more so than for class A.

If two transistors are used in class B push-pull and their curves are assumed to be ideal with no bottoming voltage, at maximum power output, peak to peak voltage swing is 2Vcc and peak to peak current swing is 2Icmax. From this information, we can calculate maximum theoretical efficiency. Rms values are derived by dividing the peak to peak values by 2 root 2 Maximum power output is calculated from the RMS values as follows.

$$Po = \frac{(2Vcc).(2Icmax)}{(2\sqrt{2})^2}$$

$$= 0.5\ Vcc\ Icmax$$

The DC current input to the stage looks like a full wave rectified signal and hence the average current is well known as 0 636 of the peak value so that DC input power is calculated as 0.636Ic.Vcc. Clearly, power efficiency is the ratio 0.5/0.636 which evaluates to 78%.

Once again, we see that our collector resistance or source resistance does not enter the calculation and the fact that source resistance is higher than load resistance is of no consequence to the power efficiency and maximum power output.

We could go on to discuss class C but the examples already presented should be sufficient to support the arguments presented. Field effect transistors have also not been discussed, but it is sufficient to say that their drain current versus drain to source voltage curves are much the same sort of shape as those of the bipolar transistor resulting in much the same high source resistance.

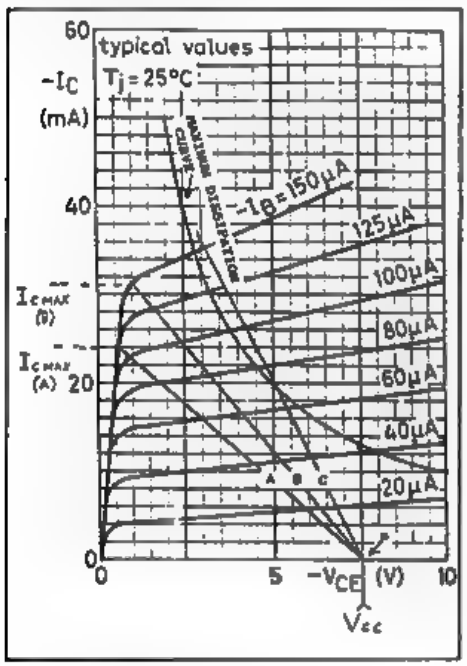


Fig 12. Class B Load lines

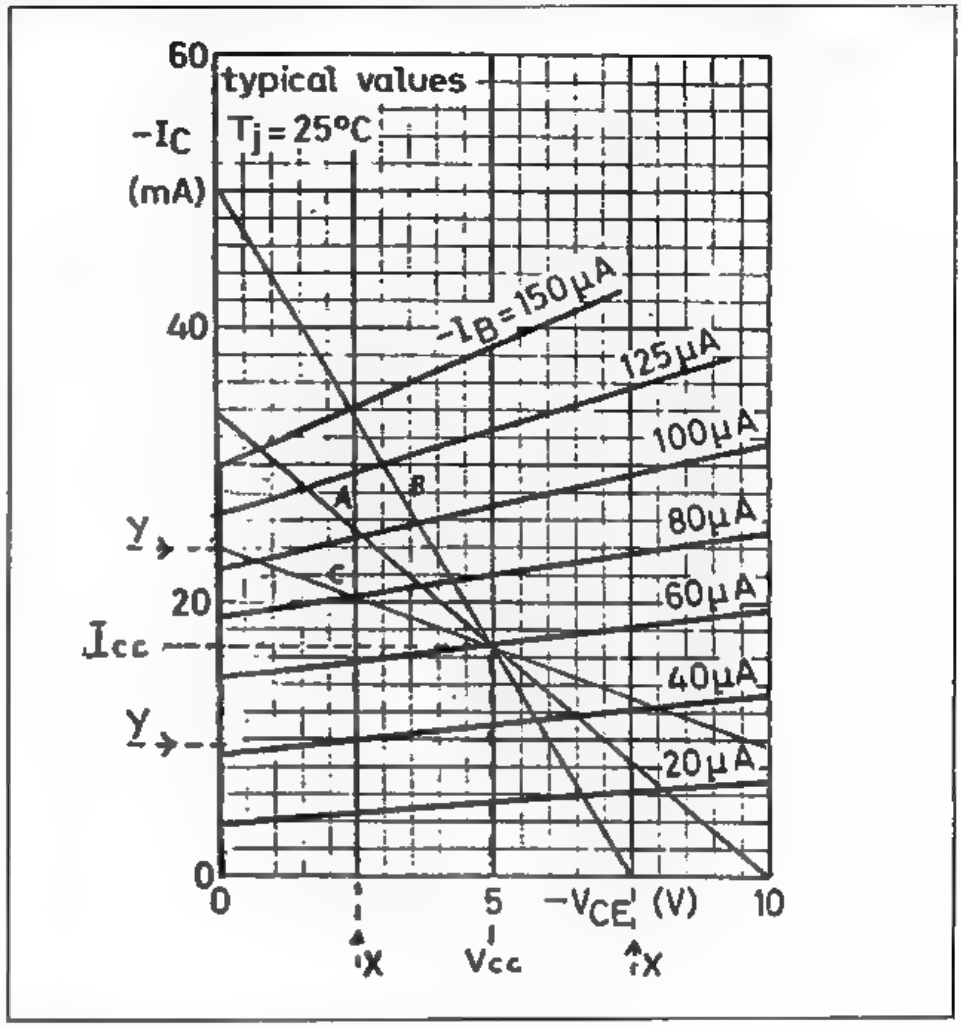


Fig 9. Effect of changing load resistance from optimum value.

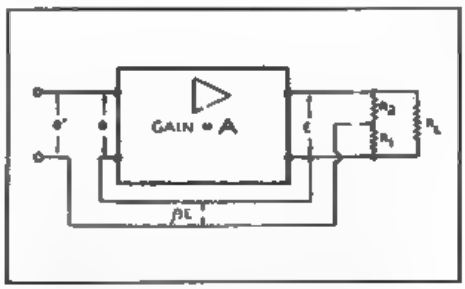


Fig 10. Negative voltage feedback

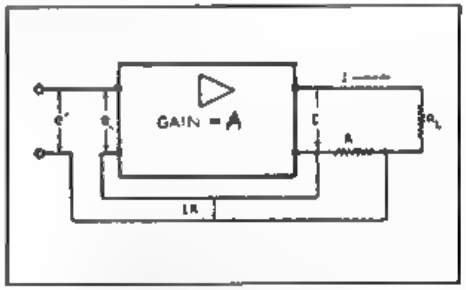


Fig 11. Negative current feedback

Summary

In setting out the arguments, the text has aimed at demonstrating the following:

(1) The term output impedance can mean source impedance or source resistance, but it is often mean to imply operational load impedance. In our discussion, we have avoided confusion by referring only to source resistance or load resistance.

(2) In tetrode and pentode power amplifiers and in transistor power amplifiers, the source resistance is normally much higher than the load resistance. In triode power amplifiers, the source resistance is lower than the load resistance.

(3) Because of the above, impedance match between the RF power amplifier source and the connected transmission line is most unlikely. Providing the transmission line load is matched for a low standing wave ratio at the transmitter output and it presents a resistive load to the transmitter equal to that for which the transmitter is designed, the mismatch of transmitter source resistance to its load is of little consequence.

(4) The fact that the transmitter source resistance is higher than the load resistance, as in the pentode, tetrode and transistor, does not limit power transfer efficiency or maximum power output as would occur if the high source resistance were inherent in a simple generator

Although it was not the specific aim, the discussion has demonstrated some of the useful applications of amplifier static characteristic curves and load lines. Without these curves, it would have been difficult to justify the various points that have been made concerning source resistance and load resistance.

A Tilt-Over Wind-Up Antenna Mast

Leigh Baker VK5UO
1/31 Chute Street
Mt Gambier 5290

(No guys, one person operation)

Once upon a time, the author was blessed with a QTH having a large backyard with plenty of room for a tower and other antenna poles and masts. Then he moved to a small home unit, one of a group to which Strata Titles applied, and was faced with several problems. Obtaining permission to erect an antenna mast was difficult enough, but it was also required that it should have no guy wires, be no higher than 9.2 metres (30 feet), and occupy an almost impossibly small base area.

The antenna to be supported was a 10-15-20 metre triband Yagi, which it was thought should, at least for 20 metres, be able to be operated at a height of more than 10 metres. It seemed advisable then that it should be capable of winding up and down, up for best performance and down both to comply with the permit conditions and to reduce wind loading when not in use. (See comments at end of article regarding wind loading. Ed).

The author had had experience in the steel industry, and so had a number of ideas about mast construction which were discussed at length with Stuart VK5MS and others. The final construction was carried out in the engineering workshop of Trevor VK5NC, and involves three main components:

1) The winch-post and base-plate
2) The lower half-mast, which tilts over but is otherwise fixed
3) The upper half-mast, which not only tilts with 2), but is carried by guides so that it can slide up and down alongside 2).

Winch-Post and Base-Plate

The winch-post is of 100 x 100 x 4.9 mm RHS (4 inch square x 3/16 wall thickness rectangular hollow section), its total length being 2.4m (8 ft approx.) Rather more than half of this post is underground. The base-plate, which is 10mm thick and 280 x 330 mm (3/8 inch x 11 x 13 inches approx) has a 100mm square cutout in one of its shorter edges into which the post is welded. The plate is at ground level, and 1340 mm of the post is below it. Two diagonal 13 mm (1/2 inch) stays below the base-plate, brace it to the post, and scraps of 75 mm (3 inch) angle iron are welded to the post as well, the whole being set in approximately a cubic metre of concrete. The details are shown in Fig 1.

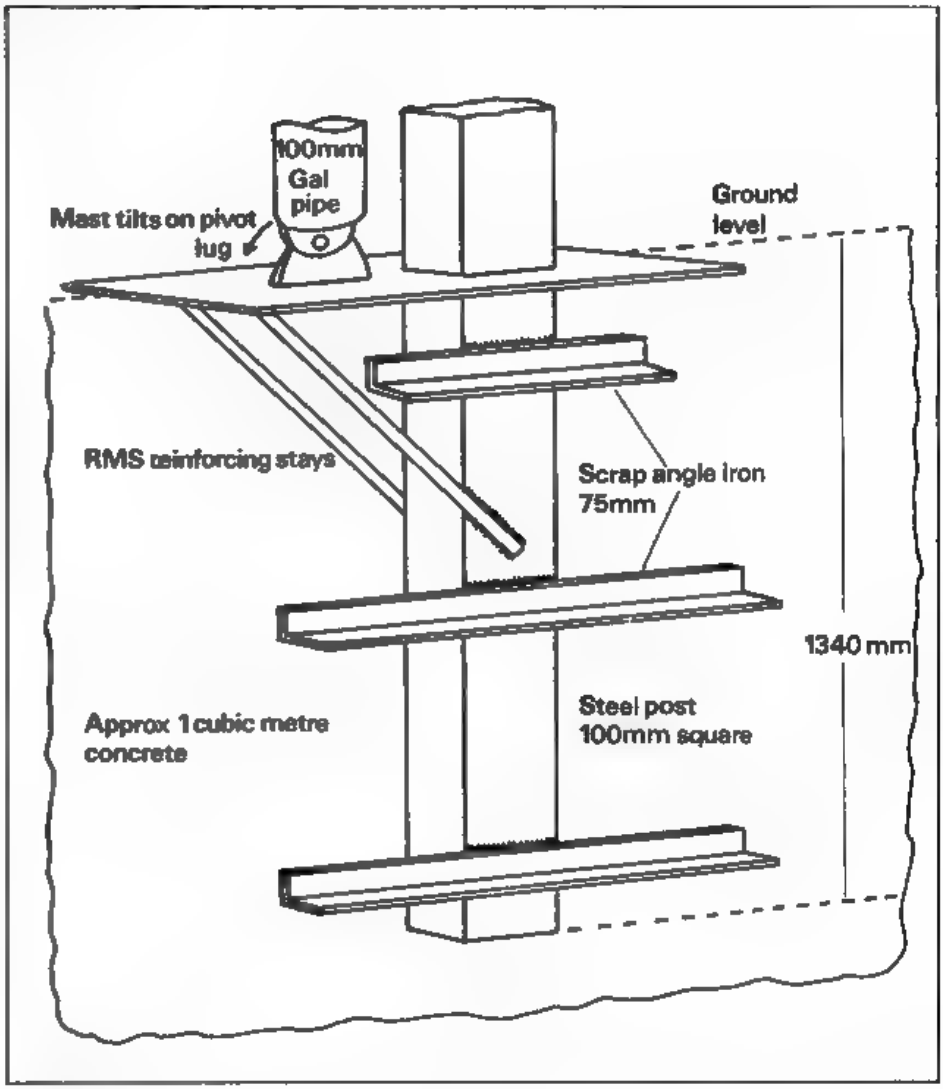


Fig1. Foundation

A substantial lug, approximately 100mm high, 75 mm wide and 20 mm thick (4 x 3 x 3/4 inches) is welded to the centre of the base-plate. The bearing hole on which the mast tilts is at the centre of the lug, about 35 mm from its top surface, and the top two corners of the lug are rounded off to about 40 mm radius from the hole, which should be at least 13 mm (1/2 inch) diameter and be a snug fit to the pivot pin. The latter may be either a clevis pin, retained by a split pin, or a plain shank bolt (and nut) about 75 mm long.

The winch is the type normally found on a medium-size boat trailer, and carries about 12 metres of 6 mm diameter wire cable. The base of the winch is securely welded to the top of the square post (but could be retained by bolts if desired, welded to a top plate). See Photo 1, for arrangement used.

Lower Half-Mast

A six metre (20 feet) length of 100 mm (4 inch) galvanised steel pipe forms the lower half of the mast. 100 NB (nominal bore) may be either 105.3 mm in medium

Photo 1 Winch

grade or 103.5 mm in heavy grade, the latter being preferable. In either case, the outside diameter is 114.3 mm (4.500 in). Metrication did not alter pipe sizes in Australia, merely the units in which they are designated. From the user's viewpoint, this means that the same dies are still used for pipe-threading, not that threading is required for this mast application.

The lower mast has several small fittings welded to it. At the bottom there are two lugs similar to that on the base-plate, but thinner (10 mm or 3/8 inch) and longer (150 mm or 6 inch). These are welded into the bottom of the mast with about half their length protruding to form the fork over the base lug, about which the mast can tilt. Photo 1 makes this clear. At the top end of the 100 mm pipe there is a cap fitting which incorporates two pulley sheaves (one 60 mm or 2 1/2 inch, the other 75 mm or 3 inch), and a bracket carrying a vertical guide sleeve for the upper mast. This sleeve is of 65 NB (2 1/2 inch) pipe to give a somewhat sloppy fit to the upper mast, the OD of which is 60.3 mm. The sloppiness of fit will depend on the 65 NB grade, the actual bore of which ranges from 69.7 mm (light grade) to 64.3 mm (extra heavy). The sleeve is about 115 mm (4 1/2 inch) long and is attached to the cap by a bracket cut from 6 mm (1/4 inch) plate. All of this is shown clearly in Photo 2, which also shows the guide tube for the winch-line. Not so clear is the top cover over the sheaves, to prevent the line from jumping out of their grooves, but this cover is plainly visible in Photo 3, which also shows clearly the cap bracket.

About 1.2 m (4 ft) below the top of the lower mast there is a second guide sleeve through which the upper mast can slide. It is simply a short piece of 65 mm (2 1/2 inch) pipe welded to distance pieces of scrap plate, which are in turn welded to the side of the lower mast. These two sleeves are positioned so as to place the upper mast immediately above the winch. The one remaining item attached to the lower mast is a stop lug (see Fig 2) about 1.5 m (5 ft) up from the bottom. It not only sets the lower limit of top-mast travel at some distance above the winch, but also permits locking it in this position prior to erection. By this means, the winch can be used to lift the whole assembly up from its rest position on the ground and tilt it up to an angle from which final erection to vertical is relatively easy. Once the assembly is vertical, it is retained in this position by a U-shaped belly strap as seen in Photo 4. The strap is made from steel 40 x 5 mm (1 1/2 x 3/16 inch) about 440 mm (18 in) long, to which are welded two 10 mm (3/8 inch) bolts, each 90 mm (3 1/2 inch) long. The bolts fit into holes in a 6 mm (1/4 inch) cross-piece welded to the post just under the winch. A packing piece of scrap steel is also welded to the post on the side nearest the mast, its thickness being chosen to ensure the mast will be vertical when it is clamped to the post.

Upper Half-Mast

Both upper and lower masts are the same length, 6 metres (20 ft), but the upper mast is only half the nominal bore of the lower, being 50 NB or 2 inch. As mentioned before, this has an outside diameter of 60.3 mm (2 3/8 or 2.375 inch), and may be obtained in four grades, with actual bores ranging from 54.5 mm to 49.5 mm (light and extra heavy grades respectively). For the present application, heavy grade (51.3 mm bore) is preferable if a large triband or 20 metre beam is to be supported, but lighter pipe should suffice for smaller antennas.

Fig 2 and Photo 4 both show the guide carriage for the top-mast. It is welded to the lower end of the top-mast, and is made from a similar bracket to that which carries the top guide sleeve, but with a larger diameter large hole to clear the lower mast by several millimetres. Three brackets are

spaced around this hole at 120 degree intervals, each carrying a 25 mm (1 inch) diameter x 13 mm (1/2 inch) thick plastic wheel or roller which bears against the surface of the lower mast. The wheel spindles are plain-shank 6 mm or 1/4 inch bolts. The wheels are cut from 25 mm (1 inch) round plastic stock. Nylon (R) is ideal, but polycarbonate or PTFE might also be acceptable

The purpose of the guide carriage is threefold. First, it prevents the top-mast from rotating, so that it can be a fixed reference for the beam rotator at its top. Second, it supports the weight of the top-mast, rotator and antenna, all of which is taken by the winch cable attached to a substantial lug welded to the top surface of the carriage between the masts (see Photo 5). Third, by providing low rolling friction compared with another sleeve guide at this point, it prevents binding which might otherwise tend to occur because the lifting force of the cable is not applied directly underneath the top-mast, but to a point alongside it. The fact that it supports considerable weight is the reason for the two 13 mm (1/2 inch) struts between carriage and top-mast, without which the carriage might bend upwards and jam on to the lower mast.

One other item visible in Photo 5 is the lower stop lug welded to the lower mast. Note that this was an earlier and simpler version than that mentioned before, and shown in Fig 2, by which the top-mast can be locked against both up and down motion relative to the lower mast.

Rotator Mounting

Prominent in Photo 3 is the rotator and its method of mounting. The purpose of the cage around the rotator and the sleeve above it is to carry a top bearing which takes the weight of the antenna (and its side wind loading) off the rotator. Whether this is necessary will depend both on the size of the antenna and the structural design of the rotator. The more husky designs of rotators should be able to support smaller antennas, eg duoband or VHF, without structural assistance.

Assembly and Erection

The mast is assembled while horizontal, or nearly so, as in Photo 3, but supported by trestles or boxes to begin with. The initial assembly must take place before the stop lug is welded to the lower mast, or before welding on either guide sleeve. In the first case (no stop lug) the top-mast can be pushed upward into the sleeves, but only if the rotator mounting has yet to be attached to its top end. In the second case (rotator already attached) the sleeves must be slid on to the top-mast before the guide car-

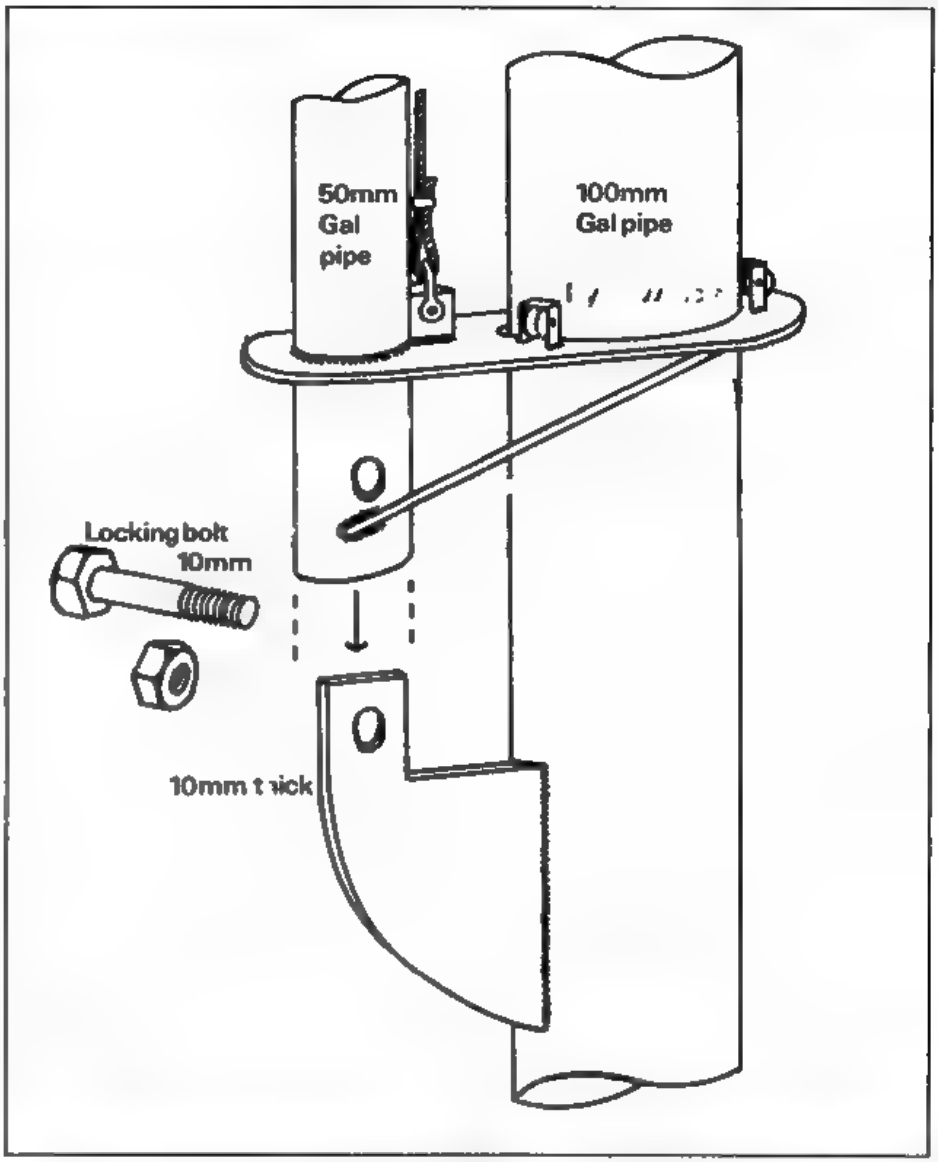


Fig 2. Stop lug and guide carriage

Photo 2. Sheave Cap

riage is attached. The carriage and top-mast is then pushed down from the top end of the lower mast until the sleeves can be located correctly and welded into place.

When the winch cable is fitted, it will be seen that it wraps around the mast from one side to the other as it passes down from the sheave cap to the winch. Other cables, the coax to the antenna and the rotator cable, can be taped to the top-mast, but only down as far as the sheave cap with the topmast bolted to the stop lug, ie in its lowest position. They must then be left un-attached to the top-mast (to allow it to move upwards through its guide sleeves) down almost to the guide carriage. To avoid leaving so much cable (about 4.7 metres or 16 ft) unsupported and free to flap in the wind, it may be better to feed it down through the top-mast. An access hole will then be needed near the top of the topmast, or perhaps two, on opposite sides, each large enough to feed one cable through. Sharp edges on these holes should be

Photo 3. Top view both masts

Photo 4. Base details

removed with a round file, so as not to abrade the cables.

After fitting the base pivot pin, and the bolt locking the topmast to the stop lug, erection commences by winding up the winch until the cable takes the weight of the mast and antenna. At this stage, a rope loop may be put around both the winch cable and the mast, and progressively pulled lower as the mast is raised. Such a rope is visible in Photo 3. As the mast comes up closer to vertical, this rope may be more convenient than the winch to bring it up the last few degrees. At full elevation, the winch loses some of its control, since it is pulling almost straight down the length of the mast, whereas the rope may be carried back behind the winch at an angle much less than vertical.

As soon as the mast is vertical, the belly strap should be put in place and its nuts secured. The locking bolt may now be removed from the stop lug. Further operation of the winch will now raise the top-mast to the desired height. At minimum extension the top of the top-mast will be about 7.6 metres (25 feet) above ground level. Wound up until the guide carriage abuts the lower guide sleeve, this increases to about 10.6 metres (35 feet). Depending on the rotator mounting arrangement, the antenna may be a metre or so higher. With the tri-band antenna used by the author the mast does sway to some extent in breezy conditions at full height, so is normally only raised to the maximum when conditions demand it, which is seldom. On windy days it is left at minimum height.

Letting It Down

If work is needed on the antenna or rotator, or if stormy weather is forecast, the mast may be readily lowered by reversing the erection procedure. The first step is to fit the locking bolt to top-mast and stop lug, then to remove the belly strap. A gentle push on the mast as the winch is allowed to start unwinding should be sufficient to start the mast tilting. Control as it comes down MUST BE MAINTAINED by only allowing the winch to unwind slowly, being ready to drop the ratchet pawl into engagement before any problem can develop! The winch cable tension increases as the elevation is reduced, so if there is a "runaway" it may be difficult to stop. A step-ladder or similar stand will need to be positioned to take the weight of the mast before the antenna touches the ground.

The author has found this mast to be a very satisfactory solution to the problems imposed by the limited space Strata Title situation. It has permitted DX band activity where, otherwise, it would have been severely restricted or impossible. It is hoped that others in similar situations may also be able to build (or have built for them) a similar mast, and gain the same benefits.

Editorial Comments

Based on the data from the author, the Technical Editor has made a number of calculations on the structural viability of the mast described in this article. The WIA accepts no responsibility for the accuracy of these calculations, and if any doubts exist they should be resolved by an independent consulting engineer, or by the engineering department of the relevant council or other municipal authority.

Presuming that both the 100 NB and 50 NB pipes are of heavy grade (5.4 and 4.5 mm wall thickness respectively) they will weigh 87 and 37 kg respectively, total 124 kg. On their own, without antenna or rotator, this will cause the winch cable tension at zero elevation to be at least 250 kg. The winch line specified may be expected to break at not less than 2000 kg, so would seem safe. The winch specification and serviceability should be checked for adequacy, particularly if the antenna and rotator add more than say 20 kg to the total weight. An extra 25 kg here increases cable tension by about 100 kg!

It is estimated that the mast alone, at full

MAGPUBS

A Special Service of the Wireless Institute of Australia

The 1989 ARRL HANDBOOK
This much updated 66th edition is well worth having, it has 1200 pages of much new and updated material now in stock -ORDER NOW- **Hard Bound 1200 Pages #WIA188 $46.00**

SPECIAL — SPECIAL 1988 ARRL Handbook ..... #WIAS002 $25.00

ARRL ANTENNA BOOK
Only released in August 1988 this 15th edition has over 700 pages of essential antenna reference material ..... **#WIA161 $36.00**

The RADIO HANDBOOK William I. Orr, W6SAI The best ever the 25 edition of the RADIO HANDBOOK gives complete documentation on the HF VHF and VHF spectrums **672 Pages 7½" x 10" Hard Bound Stock # WIA22424 $49.50**

ANTENNA NOTEBOOK *Doug DeMaw W1FB*
Practical simple wire and vertical antennas ..... **#WIA162 $16.00**

ANTENNA COMPENDIUM
Released in 1985 this book is full of new and useful information on Quads Yagis and associated topics ..... **Stock #WIA163 $22.00**

YAGI ANTENNA DESIGN
Over 210 pages of useful theory and design information on HF Yagis **#WIA164 $30.00**

TRANSMISSION LINE TRANSFORMERS
This useful 1987 book is rapidly becoming a best seller particulary amongst those interested in antennas Covers baluns use of ferrites and other aspects of antenna transmission line design and operation 128 Pages Hard Bound **Stock #WIA134 $29.00**

COMPUTER NETWORKING CONFERENCES (Packet Radio)#1 - 4
From 1981 to 1985 pioneering papers on Packet Radio .... **Stock #WIA166 $36.00**

COMPUTER NETWORKING CONFERENCE #5- 1986 ..... #WIA167 $20.00

COMPUTER NETWORKING CONFERENCE #6- 1987
Held in Redondo Beach California August 1987 The latest concepts on networking high speed modems and other packet-radio technology are discussed in 30 papers that were prepared for the conference **174 Pages Stock #WIA168 $20.00**

COMPUTER NETWORKING CONFERENCE # 7 1988 Stock # WIA184 $25.00

YOUR GATEWAY TO PACKET RADIO
The Best introduction and how-to book for anyone curious about packet or wanting to get started ..... **Stock #WIA169 $20.00**

MASTERING PACKET RADIO The Hands On Guide
208 Pages ..... Stock # WIA22567 567 $22.00

AX25 PROTOCOL SPECIFICATION ..... Stock # WIA170 $18.00

QRP NOTEBOOK *Doug DeMaw W1FB*
This small book of 76 pages is packed full of useful and interesting information on QRP equipment and operation ..... **Stock #WIA176 $10.00**

SOLID STATE DESIGN FOR THE AMATEUR DeMaw W1FB Wes Hayward
First published in 1977 and just reprinted by popular demand This book by Doug DeMaw and Wes Hayward has become the bible of many an avid home-brewer with good reason ..... **#WIA171 $24.00**

RF CIRCUIT DESIGN Chris Bowick — Published by Howard Sams This book has been written for the person who has design experience who is an expert in the field of RF circuit design or is an engineer needing a good reference
167 Pages 8½ x 11" ..... Stock # WIA21868 $39.30

VHF/UHF/Microwave conference proceedings
The following volumes represent the first time that much of the most interesting material presented at the three of the largest VHF UHF conferences in the English speaking world have been collected together These are essential reading for anyone interested in operation above 70cms

21st CENTRAL STATES VHF CONFERENCE proceedings 1987
held in Arlington Texas 23rd - 26 July 1987 28 papers covering everything from use of TVRO dishes for moon-bounce to a solid state amplifier for 5.7GHz **Stock #WIA172 $20.00**

22nd CENTRAL STATES VHF CONFERENCE proceedings
Covers papers submitted for the 1988 Conference Includes topics on microwave EME Predicting 144 MHz Es Openings Match vs Noise Figure Trade-Offs in Pre-Amps 902 MHz Transverter Power Amplifier and Antennas How to Measure Your Own K Index and How to Build VHF UHF Preamps and much more **Stock #WIA173 $24.00**

MICROWAVE UPDATE 1987 CONFERENCE proceedings
Much information on construction of 2.3 3.4 and 5.7 GHz gear **136 pages Stock #WIA174 $20.00 MICROWAVE UPDATE 1988 CONTERENCE Stock # WIA183 $25.00**

MID-ATLANTIC VHF CONFERENCE proceedings 1987
This conference was sponsored by the Mt Airy VHF Radio Club Oct 10 - 11 1987 11 papers cover everything from mountain topping to transceivers for 3400 and 5600 MHz bands **120 pages ..... Stock #WIA175 $20.00**

SATELLITE ANTHOLOGY ARRL a collection of the best of the Amateur Satelite News columns and articles out of 31 issues of QST to better document the era of **OSCAR** satellites **95 Pages 8½ x 11" ..... Stock # WIA180 $11.00**

THE SATELLITE EXPERIMENTERS HANDBOOK Martin R Davidoff ARRL Now under one cover here is the information you need to communicate through or pick-up the signals from the orbiting OSCAR satellites **11" x 8" 207 Pages Stock # WIA177 $20.00**

AMSAT - NA 5th SPACE SYMPOSIUM ..... Stock # WIA182 $25.00

Now anyone can learn morse at home

MORSE TUTOR 5¼" IBM DISC GGTE
Morse learning made easy and fun Introducing the most Comprehensive and Easy-to-Use code course available today Suits IBM PC AT and PS/2 compatibles * 1 - 100 word code speeds * Standard or Farnsworth modes * Adjustable code frequency * Over 1 Billion possible QSO's * Letter number and punctuation coverage * Self calibrating/menu design * Display text — while listening or after copying * Ideal to learn or up-grade CW
5¼" IBM compatible Disc ..... Stock # WIA187 $29.95

All the above books and many more are available from your state WIA office SPECIAL NOTE a discount of 10% may be deducted by FINANCIAL MEMBERS from all listed prices

TECHNICAL INFORMATION

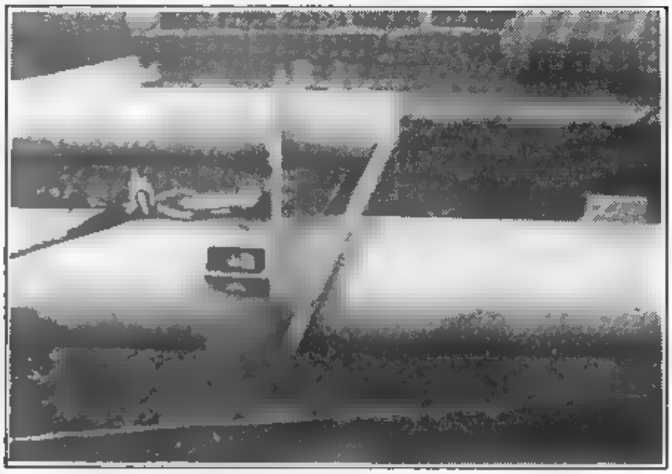


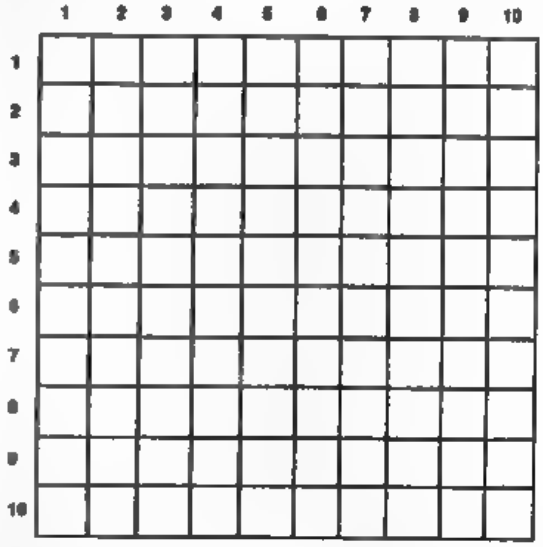
Photo 5 Cable attachment

height, should survive a wind of velocity 215 km/h (135 mph or 115 knots). With a full size, 20 metre beam antenna fitted, these figures reduce to 125 km/h (80mph or 70 knots). By lowering the same antenna to minimum height the figures improve to 145 km/h (90 mph or 80 knots). If storms are forecast, it is strongly recommended that the antenna be tilted over to near the ground, and that the mast be supported independently of the winch.

■

Morseword No. 30

SOLUTION PAGE 90



Clues

Across		Down	
1	Take the cream off	1	Gala events
2	Second-hand	2	Begin
3	Wait	3	Fissure
4	Got up	4	Give medicine to
5	Boast	5	Conceited
6	Mouth	6	Spots
7	Large rabbit	7	Flower
8	At some time	8	Be partial to
9	Turn inside out	9	Silly
10	Fruit	10	Plunge

© Audrey Ryan 1989

Radio Amateurs: Have you checked out EA lately?

No doubt most radio amateurs are aware that *Electronics Australia* is by far this country's largest-selling electronics magazine, as well as being its oldest (we began way back in 1922, as *Wireless Weekly*). But have you looked inside the magazine lately?

Remember Jim Rowe, VK2ZLO? Jim used to be Technical Editor, and then Editor – back in the late 1960's and 1970's. You may recall some of the amateur radio and test equipment projects he developed, which proved to be extremely popular. Well, Jim is back at the helm of the magazine, and has been busy giving it a new lease of life.

You'll now find lots of new 'departments' in the magazine, including Solid State Update (with news of new semiconductor devices), Silicon Valley Update (news from the USA) and What's New in Entertainment Electronics. Plus all of your old favourites like Forum, The Serviceman, Circuit and Design Ideas and so on. And of course plenty of 'meaty' technical articles and contruction projects.

FEATURES IN THE SEPTEMBER ISSUE:

ELECTRONIC 'SUN' BURSTS INTO LIFE

Tom King, VK2ATJ looks at the radio and navigation gear on the *Royal Viking Sun*, a plush new cruise ship. Very impressive!

HAM TALK

First of an occasional series of articles discussing amateur radio topics. This one looks at the achievements of Dick Norman, VK2BDN

EXPERIMENTAL HAM RADIO: MORE READER COMMENTS

Jim Rowe did stir up something of a hornet's nest with his claim in April that experimental ham radio has died. Here are more of the reader responses.

What about *amateur radio* projects? Well, there still aren't too many, at present – Jim Rowe's been a bit too busy! But he's *very* interested in boosting the amateur radio content, so if YOU have developed an exciting amateur radio project, please contact Jim by writing to him at EA, 180 Bourke Road, Alexandria 2015 or phoning him on (02) 693 6620 – to discuss the possibility of publishing it as a contributed article.

Take a look at the new, rejuvenated *Electronics Australia* – on sale at your newsagent at the beginning of every month. Or subscribe now, by phoning (02) 693 9517 or 693 9515.

Electronics Australia

Australia's Top Selling Electronics Magazine

Weather Satellites

This is the first instalment of a comprehensive collection of data on Weather Satellites compiled by Paul Hayden VK4ZBV. It has been available on the Brisbane Bulletin Board for some time, but deserves even wider distribution. We thank Brian Beamish VK4AHD for bringing it to our notice. Ed

General Information

This is intended as a general introduction to the subject of weather satellites and the reception and display of the data they transmit.

One of the first applications for space satellites was Meteorology, the science of the weather.

Prior to the satellite age which began with Sputnik-1 launched on 4 October 1957, weather forecasting was based on a large number of observations being made by many people, at many diverse places around the earth, collected and sent to a number of processing centres for interpretation.

Here the weather systems were plotted and an overall picture was built up bit by bit in an effort then to predict the future movements and their effects.

When humans ventured above the clouds and into space, they were able to see whole weather systems at a glance and a new perspective on Meteorology was born.

In the words of John Glenn from Friendship Seven during the first American manned orbital space flight: "the view is tremendous" (29 Feb 1962).

From satellites in earth orbit it soon became possible to gather information from every part of the earth and quickly assemble a global picture of the world's weather systems.

There are two common types of orbits used by weather satellites.

The first satellites were limited by launch vehicle performance to low altitudes (800-1000kms).

A near-circular polar orbit fixed in space, with the earth turning inside it, provides a ground station with either two or three useful daytime passes and a similar number of night passes every 24 hours (approx 3,000kms range about station).

If you live at the north or south pole you can receive a pass every orbit (approx 104 minutes apart).

The geostationary earth orbit became possible as launch vehicle and satellite technology improved. (Arthur Clarke 1948) (Syncom-3 1964).

A geostationary satellite is in a high circular equatorial orbit. When the altitude is around 36,000kms, the orbital period of the satellite is 1440 minutes (24 hours). Seen from a ground station the satellite remains fixed above the equator as the earth and the satellite rotate together, (a single satellite coves more than one third of the earth's surface).

American Polar Orbiting Satellites

Tiros 1, launched in 1960, was the first meteorological satellite to be equipped with television cameras. It recorded its cloud pictures on a video-tape recorder for replay when it came within range of a ground command in the USA.

Automatic picture transmission or APT was introduced with the launch of Tiros 8 in December 1963.

This system of real time picture transmission allowed a ground station equipped with relatively simple equipment to receive pictures of their area whenever the satellite was within range of the receiving station.

Nimbus1 - 8 (1964): The second generation of weather satellites, tested the hardware used in later satellite systems for both meteorological and earth and ocean resource sensing (Landsat and Seasat).

Essa 1 - 9 (1966): The third generation of weather satellites equipped with a new advanced vidicon camera system provided the mainstay systems for the Americans for the next ten years. Essa 8 was turned off in 1976 after seven years of pictures, bringing to an end an era that began with Tiros 8 and the first APT pictures.

ITOS/NOAA: Tests of the Improved Tiros Operational System (ITOS) began in 1970. The satellites were renamed NOAA when safely in orbit after their sponsor the National Oceanic and Atmospheric Administration.

NOAA 1 - 11: The current spacecraft of this series feature an advanced very high resolution radiometer (VHRR), from Nimbus. This scanner replaces the video camera with a rotating mirror and five channel multi spectral sensor covering the visible to infrared part of the spectrum. (2 vis 3 ir detectors).

The satellite can now see the visible picture by daylight, and by means of the infra-red sensors obtain a thermal picture both by day and by night.

The NOAA satellites produce a pair of pictures side by side a visible and an infrared picture of the same area, allowing a comparison which enhances the information available. (time division multiplexing) (Cloud height, land water boundaries).

NOAA transmits a high resolution digitally encoded signal on the 1.7 GHz band and a low resolution APT signal on the 137 MHz band.

Russian Polar Orbiting Satellites

The Soviet Union started its METEOR weather satellite program in 1966 with modified COSMOS photo reconnaissance satellites.

Meteor: Satellites are cylindrical, 5 metres long, 1.5 metres diameter, and over 2,000 kg in weight, with 2 TV cameras, one (visible light) for day, one (infrared) for night.

Starting with Meteor 1.10 in 1971 these satellites began transmitting APT format pictures, on the 137MHz band. By 1980, 30 Meteor 1 series satellites had been identified.

Meteor 2: The current series weather satellites started in 1975, with improved picture quality and with three satellites in similar polar orbits spaced 120 degrees apart around the equator providing passes every few hours, day or night.

Meteor 2 series satellites transmit a single picture visible by day, infrared by night. (Unlike the US NOAA series with its side by side pix).

They are also switched on and off automatically on certain orbits.

Due to the picture format and the sync waveform, the Meteor 2's have a distinctive honk, honk, sound compared to the NOAA's faster tick tock tick tock sound.

Meteor 3 series satellites produce normal or high resolution APT pictures. The picture format changes seem to indicate that they are similar to the American Nimbus experimental spacecraft and are used to test equipment developments for future spacecraft.

They are commanded on and off more often than Meteor 2 satellites and are often not heard for months at a time.

Cosmos #: A number of Cosmos satellites have been found producing pictures in the 137 MHz band. (Cosmos devices are of military origin.)

There have been several unidentified satellite signals that produce pictures on the 137 MHz band. It is likely that these are of Soviet origin.

Geostationary Satellite Systems

The first geostationary satellite, a telecommunications transponder, Syncom 3, was able to relay telephone and TV signals between Japan and the USA. It was launched in August 1964.

ATS 1: The first Applications Technology Satellite was placed in orbit over the Pacific Ocean at a height of 35,817 km in December 1966.

The ATS satellites were built to test telecom systems, satellite control systems, station keeping methods, navigation and meteorology experiments.

ATS 1 was able to relay signals over an area from the east coast of Australia to the east coast of the USA. The VHF transponder was still working when the satellite was removed rom geostationary orbit in the mid 1980s after almost twenty years. (The transponder input was 149.22 MHz and output 135.6 MHz.)

SMS 1: The Synchronous Meteorological Satellite was the first American geostationary weather satellite; it was launched in 1974.

Later satellites in the series were called Geostationary Operational Environmental satellites or GOES for short.

They are spin-stabilised to keep their axis in line with the earth's axis and provide the horizontal scanning movement for the visible infrared spin scan radiometer or VISSR, a telescope with two sensors looking out the side of the spinning body. It takes 20 minutes to scan the entire hemisphere facing the satellite by gently precessing the axis of the satellite to provide the vertical scan motion (N-S).

The full disk picture of over 4,000 lines is transmitted to main frame computers at the earth station control centre. Here the images are stored, processed, gridded to show lat/long and land outlines, before retransmission back to the satellite transponder for distribution as weather facsimile (wefax) pictures.

The satellite also acts as a data collection platform receiving signals from remote stations and re-transmitting them to the control station (range 4,000 km).

GMS 1 - 3: The Japan meteorological agency satellite launched in mid 1977 is stationed over New Guinea at 140 degrees E longitude.

Meteorsat 1 - 2: Is the European Space Agency version of the geostationary satellite. It was launched late in 1977 and took up station over West Africa on the zero meridian.

Both GMS and Meteorsat are similar in features to the GOES system despite the differences in the hardware and software.

The Soviet Union's geostationary satellite GOMS, beaten to the Indian ocean by GOES is still a ten year old rumour.

To be continued.

MIRAGE /KLM

when only the best will do

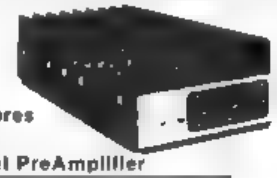
Stewart Electronics are proud to announce there appointment as the Australian representives for MIRAGE/KLM amplifiers and antennas

Why the best? Not only are all MIRAGE/KLM built to the most exacting standards they are also designed by some of the best engineers in the industry. Please don't come to us looking for the lowest priced products .... we don't sell cheap products .... what we do sell is the best we can find from sources that back their product with a five year warranty (except for power transistors) on products that won't let you down. All MIRAGE/KLM are made in the United States to the highest standards.

MP2 VHF Peak Reading Wattmeter
FEATURES • 50 to 200MHz • Peak or Average Reading • Reads SWR directly — without extra charts or graphs • Remote Coupler Mounting • High quality meter movement
$371 Stock No ML016

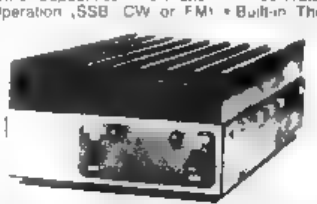
MP1 HF Peak Reading Wattmeter
FEATURES • 1.8 to 30MHz • Peak or Average Reading • Reads SWR directly — without extra charts or graphs • Remote Coupler Mounting • High quality meter movement
$371 Stock No ML015

B3019 2 Metre Amplifier
FEATURES • Built-in receive preamp • Adjustable relay delay for SSB • Remote control operation with optional RC 1 Remote Head • Automatic internal or external relay keying
Now Features a Built In GaaSFet PreAmplifier
$651 Stock No ML007

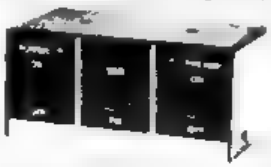


All prices include SALES TAX and are subject to change without notice. Please phone for current price before ordering.

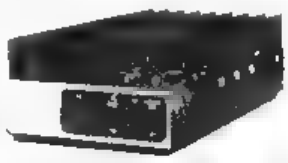
A1015 – 6 Metre Amplifier
FEATURES • Built-in Receive Preamp • Remote Keying • Remote Control Capabilities • 10 Watts In — 150 Watts Out • All mode Operation (SSB CW or FM) • Built-in Thermal Protection
$753 Stock No ML001



RC-1 Amplifier Remote Control
FEATURES • For remote control of all MIRAGE amplifiers except B23A, C22A and D24 • Small size for convenient mounting • Same attractive styling as all MIRAGE products • Allows for trunk or under seat mounting of amplifiers
$100 Stock No ML019



D3010 430-450MHz Amplifier
FEATURES: • All-mode FM SSB CW ATV • Adjustable delay for SSB • Remote control operation with optional RC 1 Remote Head • Hi Power Input
$773 Stock No ML014



STEWART ELECTRONIC COMPONENTS Pty Ltd
BankCard, VISA, M/C, welcome
Phone (03) 543 3733
Fax (03) 543 7238
Don't forget Stewart Electronics STOCKS the full range of AMIDON Ferrites [send now for your FREE catalogue]

Early Background of Our Telegraph Codes

Lloyd Butler
VK5BR
18 Ottawa Avenue
Panorama 5041

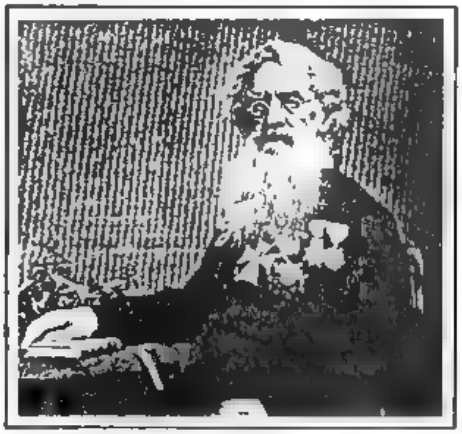
The most common codes used in amateur radio telegraphy are well known as the Morse code and the Baudot machine-code. However, our Morse code is not the same code as that first introduced by Samuel F B Morse and our Baudot code is not the same as that introduced by Jean Maurice Baudot.

Introduction

This article discusses the telegraph codes which were first developed and which have led up to the codes used in amateur radio today. In tracing their background, we are briefly introduced to some of those famous pioneers of telegraphy such as Morse, Wheatstone, Baudot and Murray. For the benefit of those amateurs who have yet to be introduced to the realms of RTTY and other forms of automatic serial data transmission, detail on the format of the various codes is included in tables and figures.

Morse Code

Samuel F B Morse developed the first successful telegraph in the United States of America over some years up to 1837. This was coincident with work carried out in England leading to a patent taken out for the telegraph, jointly by Sir Charles Wheatstone and William F Cooke, in 1837. (All of us are familiar with the Wheatstone Bridge which bears the name of Sir Charles. Although the bridge was originally devised by S H Christie, Wheatstone introduced it as a practical device.)



Samuel F B Morse, inventor of the electric telegraph

The Morse telegraph receiver incorporated an electromagnet which attracted an armature connected to mark the received signal on a band of paper, moved by clockwork. Morse's assistant, Alfred Vail, later redesigned the telegraph to include an electromagnetic sounder as the receiving instrument. Morse took out a patent for his telegraph in 1840.

The Morse telegraph was different from the Wheatstone/Cooke telegraph which appears to have been a type of analogue system in which an electric current controlled the strength of an electromagnetic field to determine the degree of deflection of a magnetic needle. The needle was arranged to point at a specific alphabetic letter as determined by the controlling current. Morse used a two state (either mark or space) telegraph system as is still in use today.

With Government support, Morse built his first practical telegraph line between Washington D C and Baltimore Maryland (a distance of 64 km) in 1843. The first message was sent over the line on May 24, 1844.

For use on his telegraph, Morse developed a code for the various alphabetic letters, numeric figures and other characters, made up of combinations of short, long and very long mark elements called dots, dashes and long dashes respectively. A dash had a time period equal to two dots.

A •—	B —•••	C —•—•	D —••	E •	F ••—•	G ——•
H ••••	I ••	J •———	K —•—	L •—••	M ——	N —•
O ———	P •——•	Q ——•—	R •—•	S •••	T —	U ••—
V •••—	W •——	X —••—	Y —•——	Z ——••	& •—•••	
1 •————	2 ••———	3 •••——	4 ••••—	PERIOD •—•—•—	INTERROGATION ••——••	
5 •••••	6 —••••	7 ——•••	8 ———••	COMMA ——••——	EXCLAMATION —•—•——	
9 ————•	0 —————					

Table 1. The original Morse code

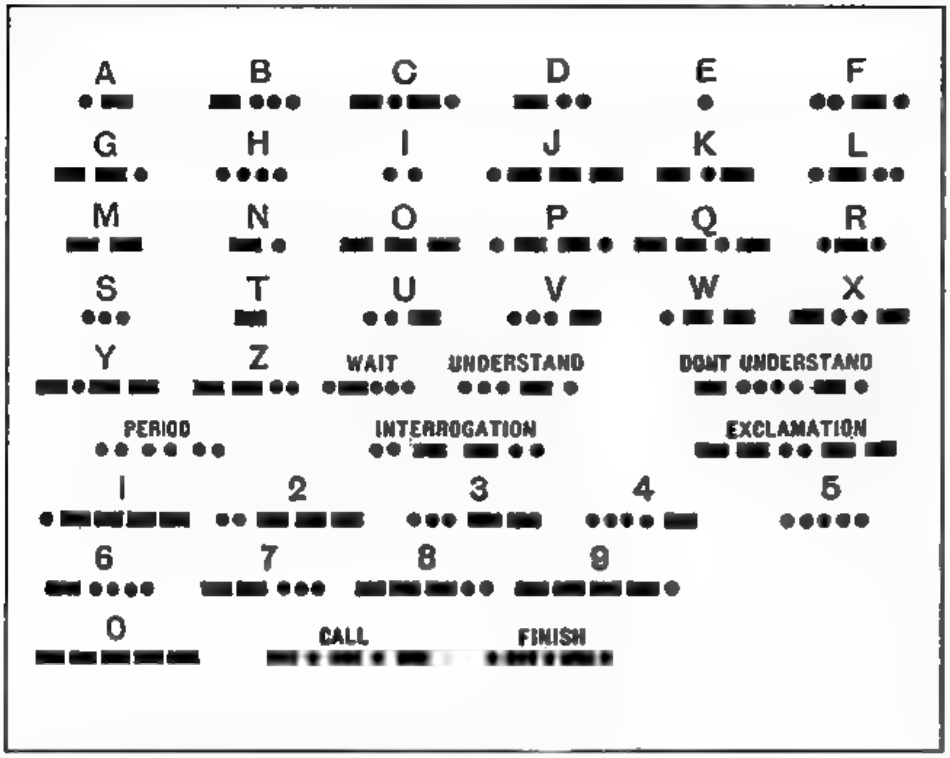


Table 2. The Continental or International code (Ref. 1.)

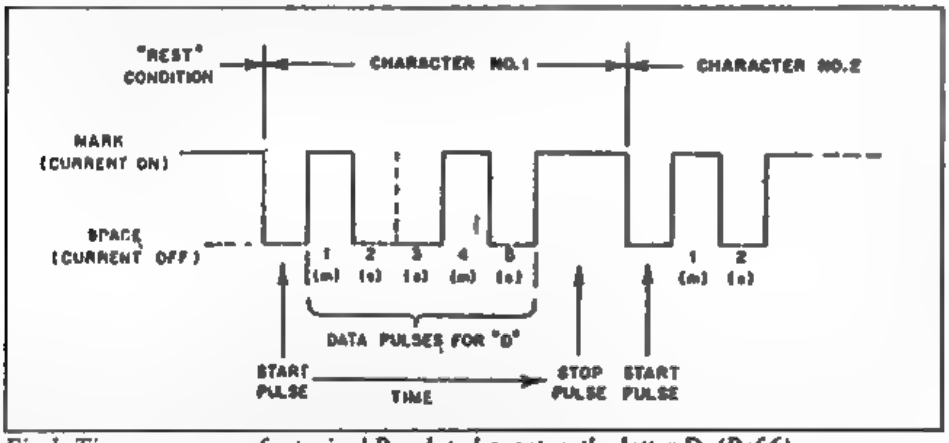


Fig 1. Time sequence of a typical Baudot character, the letter D. (Ref.6)

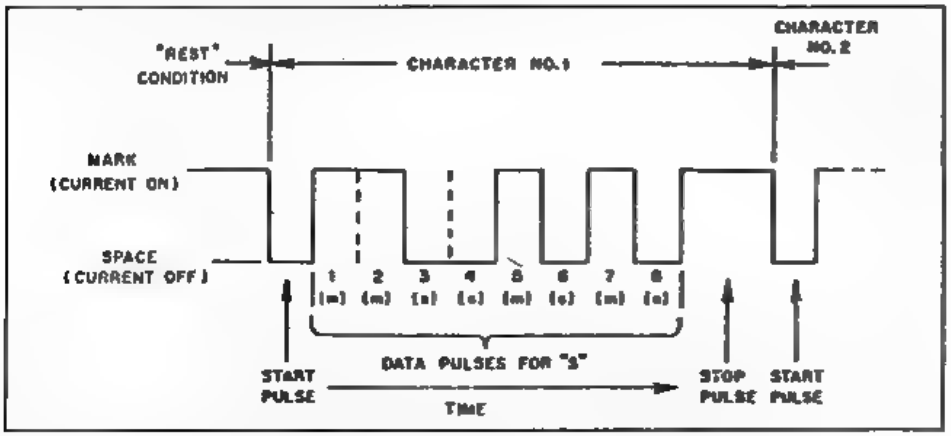


Fig 2. Time sequence of a typical ASCII character, the letter S. The eighth or parity bit may be set for any of four conditions:(1) always mark, (2) always space, (3) odd parity or (4) even parity. All four choices are in common usage.

a long dash had a time period equal to four dots and the time space between dots was equal to one dot. The format of the code, somewhat different from that which we use to day, is shown in table 1.

Morse actually introduced two versions of his Morse code. The code he used in 1837 had the same symbol for some of the phonetically similar letters. A new version, as shown in table 1 with unique symbols for each letter, was introduced around 1844 and became known as the American Morse code. An article by Tony Smith G4FAI (Ref 11) discussed this in more detail.

In 1851, the Morse code was simplified, by International Convention, to that shown in table 2. This International or Continental code is the one we all use today, although at one time both codes were apparently in use. According to a handbook by Victor H Laughter, published in 1909 (Ref 1), Morse code was used for overland service and Continental code was used between ships of the Navy and shore stations

The timing format for our international code has been standardised as follows : A dash has a time equal to three dots. Time space between elements of a character is equal to one dot. The time space between letters of a word is equal to three dots. The time space between words was previously equal to five dots, but this was changed by international agreement in 1949 to seven dots.

Table 3, originating from the G4FAI article, compares the symbols used for alphabetic letters in the three versions of the code.

Machine Telegraph Codes

Other codes have been introduced with the development of keyboard operation and machine telegraphy. Codes were developed by Jean Maurice Baudot and Donald Murray using five elements of mark or space in serial form for each character symbol. Five elements are insufficient to define separately all letters of the alphabet, numeric figures and punctuation and hence two character symbols were allocated to shift between letters and figures or punctuation, so that each other character symbol performed two functions Added to each five element symbol were also two additional elements to define the start and stop of the symbol for synchronisation.

The five element codes are still in use today in the communications services, including amateur radio, but these codes are quite different from the first code introduced by Baudot. The Baudot code was designed to suit manual operation from a pianoforte type keyboard of five keys, one for each element in a symbol. This original code is also knows as the CCITT No 1 code and this is shown in table 4 (CCITT is an

	1837 code	American Morse (1844)	International Morse (1851)
A	·–	·–	·–
B	–···	–···	–···
C	–·–·	––·	–·–·
D	–··	–··	–··
E	·	·	·
F	··–·	··–·	··–·
G	––·	––·	––·
H	····	····	····
I	··	··	··
J	·–––	·–––	·–––
K	–·–	–·–	–·–
L	·–··	·–··	·–··
M	––	––	––
N	–·	–·	–·
O	–––	–––	–––
P	·––·	·––·	·––·
Q	––·–	––·–	––·–
R	·–·	·–·	·–·
S	···	···	···
T	–	–	–
U	··–	··–	··–
V	···–	···–	···–
W	·––	·––	·––
X	–··–	–··–	–··–
Y	–·––	–·––	–·––
Z	––··	––··	––··

Table 3. Changes in Morse over the years

abbreviation for Consultative Committee for International Telegraph and Telephone.)

The code used today has been based on automatic telegraph systems in which the operator is relieved of the burden of setting up individual code elements. Instead, the operator has only a single key of a typewriter keyboard for each character. This code, which is accredited to Murray, has been defined as the CCITT No 2 code. United States amateur radio operators have generally adopted a version of a "Military Standard" code which has a few minor symbol and punctuation changes to that of the Murray or CCITT No 2 code. The reason for the US amateur choice is largely associated with the ready availability of military surplus machines in the post-1945 years. Other amateurs, particularly in Europe, have standardised on the CCITT No 2 code. The code is shown in table 5, with variations to suit particular services. One limitation of the five element codes is that there is no provision for both upper and lower case alphabetic letters.

In Australia, in line with a United States trend, we refer to the code we use for amateur radio teletype (RTTY) as the Baudot code, when in fact, it would be more appropriate to call it the Murray code. According to George Henry K9GWT (Ref 6), it is actually called the Murray code in some countries

CCITT CODE NO. 1

Sl. No. of combination	Lower Case	Upper Case	Code elements				
			1	2	3	4	5
1	A	1	1	0	0	0	0
2	B	8	0	0	1	1	0
3	C	9	1	0	1	1	0
4	D	0	1	1	1	1	0
5	E	2	0	1	0	0	0
6	F	*	0	1	1	1	0
7	G	7	0	1	0	1	0
8	H	+	1	1	0	1	0
9	I	*	0	1	1	0	0
10	J	6	1	0	0	1	0
11	K	(	1	0	0	1	1
12	L	=	1	1	0	1	1
13	M	)	0	1	0	1	1
14	N	*	0	1	1	1	1
15	O	5	1	1	1	0	0
16	P	%	1	1	1	1	1
17	Q	/	1	0	1	1	1
18	R	—	0	0	1	1	1
19	S	.	0	0	1	0	1
20	T	*	1	0	1	0	1
21	U	4	1	0	1	0	0
22	V	'	1	1	1	0	1
23	W	?	0	1	1	0	1
24	X	,	0	1	0	0	1
25	Y	3	0	0	1	0	0
26	Z	:	1	1	0	0	1
27	Carriage Return		1	1	0	0	0
28	Line Feed		1	0	0	0	1
29	Letter shift (space)		0	0	0	0	1
30	Figure shift (space)		0	0	0	1	0
31	Error		0	0	0	1	1
32	Instrument Idle		0	0	0	0	0

0 indicates space=positive current in a Baudot multiplex.
1 indicates Mark=negative current in a Baudot multiplex.
* indicates Free for internal use by a country or administration.

Table 4. The Baudot or CCITT Code No.1 (Ref.5)

The code used for many years in teleprinter and teletype service by the old PMG's Department (now Telecom Aust) is similar to the CCITT No 2 code. A copy of Telegraphy II (Ref 9), issued around 1940 and part of the PMG Course of Technical Instruction, specifically deals with teleprinter and teletype machines and systems of that day. This publication gives no specific name to the code and refers to it simply as the five unit code

The ASCII Code

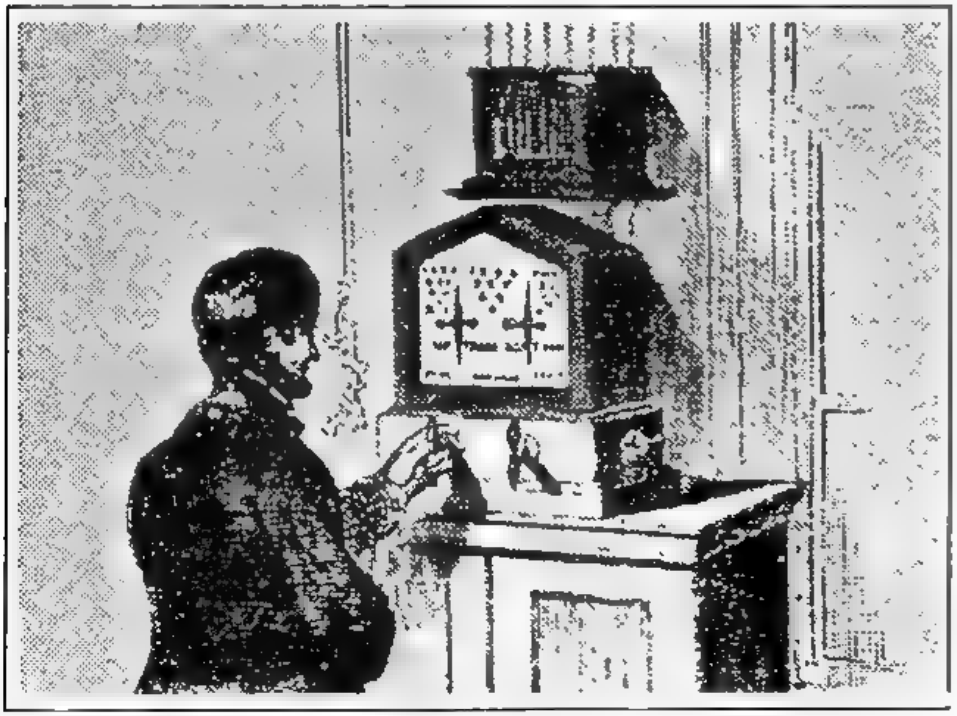
With the development of computers and high speed data exchange, ASCII has become a common serial data code and this code uses seven mark or space elements or bits to define each character. ASCII is an abbreviation for American Standard Code for Information Interchange and was adopted by the American National Standards Institute in 1968. The code actually utilises an eight bit byte with the eighth bit often used for parity error check on the other bits. Additional start and stop bits are also included when operated in the non-synchronous mode as used in the teletype service. With seven bits available, all letters (including upper and lower case), all numerals and all punctuation characters are allocated a unique character symbol or byte. The arrangement of the first seven bits, for each of the characters, is shown in table 6.

The ASCII code is much more versatile than the five element codes, with one bit state difference between upper and lower case letters and additional symbols for control and printing operations, particularly suited for use with computers.

Bit Numbers 5	4	3	2	1	Letters Case: International Alphabet #2	Figures Case: International Alphabet #2	US Alphabets: Military Std	Weather	TWX	Telex
0	0	0	0	0	Blank*	Blank*	Blank*	—	Blank*	Blank*
0	0	0	0	1	E	3	3	3	3	3
0	0	0	1	0	Line Feed	Line Feed	Line Feed	Line Feed	Line Feed	Line Feed
0	0	0	1	1	A	—	—	↑	—	—
0	0	1	0	0	Space	Space	Space	Space	Space	Space
0	0	1	0	1	S	(Apos) '	Bell	Bell	Bell	(Apos) '
0	0	1	1	0	I	8	8	8	8	8
0	0	1	1	1	U	7	7	7	7	7
0	1	0	0	0	Car. Ret	Car. Ret	Car. Ret	Car. Ret	Car. Ret	Car. Ret
0	1	0	0	1	D	WRU	$	↓	$	WRU
0	1	0	1	0	R	4	4	←	4	4
0	1	0	1	1	J	Aud Sig	(Apos) '	↑	(Comma) ,	Bell
0	1	1	0	0	N	(Comma) ,	(Comma) ,	→		(Comma) ,
0	1	1	0	1	F	!	!	↓	½	$
0	1	1	1	0	C	:	:	←	WRU	:
0	1	1	1	1	K	(	(	↑	½	(
1	0	0	0	0	T	5	5	→	5	5
1	0	0	0	1	Z	+	"	↓	"	"
1	0	0	1	0	L	)	)	←	½	)
1	0	0	1	1	W	2	2	↑	2	2
1	0	1	0	0	H	#	Stop	→		#
1	0	1	0	1	Y	6	6	↓	6	6
1	0	1	1	0	P	0	0	←	0	0
1	0	1	1	1	Q	1	1	↑	1	1
1	1	0	0	0	O	9	9	→	9	9
1	1	0	0	1	B	?	?	↓	½	?
1	1	0	1	0	G	&	&	←	&	&
1	1	0	1	1	Figures	Figures	Figures	Figures	Figures	Figures
1	1	1	0	0	M	.	.	.	.	.
1	1	1	0	1	X	/	/	↓	/	/
1	1	1	1	0	V	=	;	←	½	;
1	1	1	1	1	Letters	Letters	Letters	Letters	Letters	Letters

Notes: Transmission Order: Bit 1→Bit 5.
* "Blank" in US; "No Action" in International Alphabet #2.
(↑) Unassigned (domestic variation, not used internationally).

Table 5. The Murray or CCITT Code No 2 with variations. (Ref 8)



Cooke & Wheatstone telegraph used on the Croydon Railway 1845 (Ref. 10)

Start and Stop Bits

The five element codes and the ASCII code use similar start and stop elements or bits. The start bit is a zero or space signal equal in duration to a single character bit. The stop bit is a one or mark signal with a minimum duration between that of one and two character bits, depending on the system. The maximum stop period is as long as desired as the stop mark condition remains until the next character is initiated by the start space pulse.

Typical timing formats for a character train in the five unit and ASCII codes are shown in figures 1 and 2, respectively.

Summary

In conclusion, we see that the manual code we use today and call Morse is really a development of the original Morse code called the International or Continental code. The teletype code we use today and call Baudot is really the Murray or CCITT No 2 code. Some things we manage to get right

as the code we call ASCII is really ASCII.

Without doubt, the manual code we use will always be known as Morse and in Australia, the five unit code will continue to be called Baudot by the radio amateur. Notwithstanding this, it is interesting to examine the background of these codes, an important part of our communications history.

References :

1 *Operators Wireless Telegraph & Telephone Handbook, Victor H Laughter, 1909.*
1 *New Age Encyclopedia, 1965.*
3 *The World Book Encyclopedia.*
4 *Telegraphy, J W Freebody, 1958.*
5 *Principles of Telegraphy, N N Biswas, 1964.*
6 *ASCII, Baudot and the Radio Amateur, George W Henry Jr K9GWT, QST September 1980.*
7 *Radioteletype, Tom Moffat VK7TM, ETI October 1984.*
8 *Reference Data for Radio Engineers, ITT, 5th Edition 1968, Section 30.*
9 *Telegraphy II, Course of Technical Instruction, PMG Dept. (1940 era).*
10 *Names From the Past - Sir Charles Wheatstone by Tony Smith G4FAI - Practical Wireless, October 1984.*
11 *The Origins of Morse - Tony Smith G4FAI - Practical Wireless February 1986.*

	7	0	0	0	0	1	1	1	1
	6	0	0	1	1	0	1	0	1
	5	0	1	0	1	0	1	0	1
4321									
0000		NUL	DLE	SPC	0	@	P		p
0001		SOH	DC1	!	1	A	Q	a	q
0010		STX	DC2	"	2	B	R	b	r
0011		ETX	DC3	#	3	C	S	c	s
0100		EOT	DC4	$	4	D	T	d	t
0101		ENQ	NAK	%	5	E	U	e	u
0110		ACK	SYN	&	6	F	V	f	v
0111		BEL	ETB	'	7	G	W	g	w
1000		BS	CAN	(	8	H	X	h	x
1001		HT	EM	)	9	I	Y	i	y
1010		LF	SUB	*	:	J	Z	j	z
1011		VT	ESC	+	;	K	[	k	{
1100		FF	FS	,	<	L	\	l	|
1101		CR	GS	-	=	M	]	m	}
1110		SO	RS	.	>	N	^	n	~
1111		SI	US	/	?	O	_	o	DEL

ACK = acknowledge
BEL = signal bell
BS = backspace (←)
CAN = cancel
CR = carriage return
DC1 = device control 1
DC2 = device control 2
DC3 = device control 3
DC4 = device control 4
DEL = (delete)
DLE = data link escape
ENQ = enquiry (WRU)
EM = end of medium
EOT = end of trans.
ESC = escape
ETB = end of block
ETX = end of text
FF = form feed (home)
FS = file separator
GS = group separator
HT = horizontal tab (→)
LF = line feed (↓)
NAK = not acknowledge
NUL = null
RS = record separator
SI = shift in
SO = shift out
SOH = start of heading
SPC = space
STX = start of text
SUB = substitute
SYN = synchronous idle
US = unit separator
VT = vertical tab (↑)

Note: "1" = mark " = hole in punched tape

Table 6. The ASCII code (Ref 6)

Wilkie Trading Co.

• 1 x DAIWA DC7055 ANT. ROTATOR c/w control box & two motor units $150.00.
• 150 x CALCULATORS H/H and DESK TOP. HP, Sanyo, Canon, Sharp, etc, from $5.00 ea.
• 20 x HEAD SETS c/w boom mic., leads, PTT, from $30.00.
• 3 x MARCONI NOISE GEN. Type: TF1106 $75.00 ea.

Please telephone before calling
Phone: (03) 302 1134
Factory 1, 26 Kyabram Street,
Coolaroo, Victoria 3048

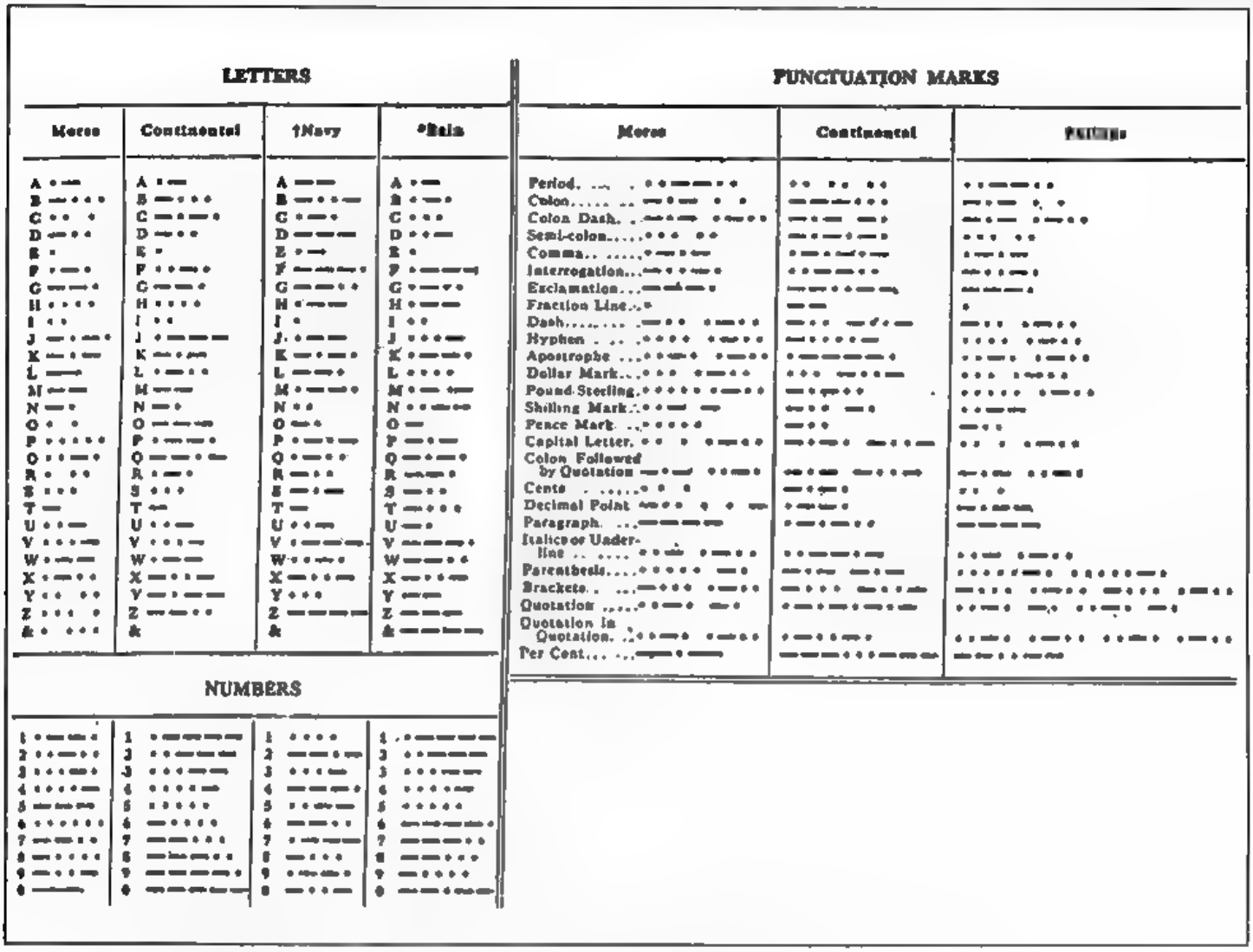
Addendum

Since submitting the article, the writer has received a copy of the Hawkins Electrical Guide No 8 from Trevor Howard (VK5BWF) of Port Lincoln. This book, published in 1917, describes a number of further versions of Morse code, the Navy code, the Bain code and the Phillips code (Refer Table 7).

According to the supporting text, the Navy code was used up to November 1912 when the Navy replaced it with Morse. The Hawkins book is an American publication and they are assumed to be referring to the USA Navy.

The Bain code was stated to be obsolete at the time of publication but had been previously used in parts of America and Europe with the Bain Chemical Telegraph System. No further detail was given.

The Phillips code was used for press work in the United States. The letters and numerals of this code are the same as in Morse, but there are differences in some of the punctuations and other symbols. The publication further states that, at that time, there were three codes in general use. The Morse code was used exclusively in the United States and Canada. The Continen



LETTERS

Morse	Continental	†Navy	*Bain
A • —	A • —	A — —	A • —
B — • • •	B — • • •	B — • • •	B • — •
C — • — •	C — • — •	C — • — •	C • • •
D — • •	D — • •	D — • •	D • • —
E •	E •	E •	E •
F • • — •	F • • — •	F — — — •	F • — — —
G — — •	G — — •	G — — •	G • — •
H • • • •	H • • • •	H • — — —	H • — —
I • •	I • •	I •	I • •
J • — — —	J • — — —	J • — — —	J • • —
K — • —	K — • —	K — • — •	K • — — •
L • — • •	L • — • •	L — — •	L • • •
M — —	M — —	M — —	M • —
N — •	N — •	N — •	N • — — —
O — — —	O — — —	O — — —	O —
P • — — •	P • — — •	P — — • —	P — • —
Q — — • —	Q — — • —	Q • — — •	Q — • — •
R • — •	R • — •	R — • —	R — — •
S • • •	S • • •	S — • —	S — •
T —	T —	T —	T — • •
U • • —	U • • —	U • • —	U — •
V • • • —	V • • • —	V • • • —	V — — — •
W • — —	W • — —	W • — —	W — — •
X — • • —	X — • • —	X — • • —	X — • • —
Y — • — —	Y — • — —	Y — • — —	Y — —
Z — — • •	Z — — • •	Z — — • •	Z — — —
& • — • • •	&	&	& — — — —

NUMBERS

1 • — — — —	1 • — — — —	1 • • • •	1 • — — — —
2 • • — — —	2 • • — — —	2 — — • —	2 • • — — —
3 • • • — —	3 • • • — —	3 • • • —	3 • • • — —
4 • • • • —	4 • • • • —	4 — — — •	4 • • • • —
5 • • • • •	5 • • • • •	5 • • — •	5 • • • • •
6 — • • • •	6 — • • • •	6 — — • •	6 — • — • —
7 — — • • •	7 — — • • •	7 • — — —	7 — — — • •
8 — — — • •	8 — — — • •	8 — — • •	8 — — — • •
9 — — — — •	9 — — — — •	9 • — — —	9 — — — — •
0 — — — — —	0 — — — — —	0 — • — —	0 — — — — —

PUNCTUATION MARKS

Morse	Continental	Phillips
Period. . — . • • — — — •	• • • — • —	• • — — • •
Colon. . . . . — — — • • •	— — — • • •	— • — • • •
Colon Dash. . — — — • — •	— — — • — •	— — — • — •
Semi-colon. . . . . • • • — • — •	— • — • — •	• • • • • •
Comma. . . . . • — • — • —	• — • — • —	• — • — —
Interrogation. . . — • • — •	• • — — • •	— • • — •
Exclamation. . . — — • — —	— — • • — —	— — — •
Fraction Line. . •	— —	•
Dash. . . . . — • • • • —	— • • • • —	— • • • • —
Hyphen . . . . • • • • • —	— • • • • —	• • • • • —
Apostrophe . . . • — — — — •	• — — — — •	• — — — •
Dollar Mark. . . • • • • — • •	• • • — • • —	• • • • — • •
Pound Sterling. • • • • • • — • •	— • — • •	• • • • • — • •
Shilling Mark. . • • • — —	— • • — •	• • — — —
Pence Mark. . . • • • • •	— — • •	— — • •
Capital Letter. • • • • — • •	— — • • — — •	• • • • — • •
Colon Followed by Quotation — • — • • •	— • — — • — •	— • — • — •
Cents . . . . . • • •	— • — •	• • •
Decimal Point — • — • •	• — • — •	— • — — —
Paragraph. . . — — — — —	• — • — • •	— — — — —
Italics or Underline . . . . . • • — — •	— • — — • —	• • — — • •
Parenthesis. . . . • — • — —	— • — — • —	• — • — — • — • — — •
Brackets. . . . — — • — • •	— — • • — — •	— — • — • — • • — — • •
Quotation . . . . . • — • — •	• — • — • — •	• — • — • — •
Quotation in Quotation. . • — • — •	• — • — • —	• — • — • — • — • — •
Per Cent. . . . — • — —	— — — • • — — —	— — • • — —

Table 7. Early codes including The Navy Code, The Bain Code and The Phillips Code

tal code was used in all European and other countries and for all submarine telegraphy by international agreement. The third code was the Phillips, referred to in the previous paragraph. The book discusses further the understandable confusion which existed in the early days of wireless telegraphy at sea, and when both Morse code and Continental code were in use before the Continental code was standardised. The transatlantic ships carried Continental code operators and the United States coastal steamers carried Morse code operators.

All in all, we have now accounted for six different versions of the Morse, or near similar, type code :-

Early Morse 1837
American Morse 1844
International or Continental code 1851
The Navy code
The Bain code
The Phillips code
Surprising, isn't it! ar

Radio Infringement Notices

On-the-spot fines similar to those used for road traffic offences are now being issued for offences against the Radiocommunications Act. Until recently DOTC could only prosecute offenders through the courts. This was a costly exercise and could take months before cases were heard and decided. However, Departmental officers can now issue a "Radio Infringement Notice" to offenders.

A person served with a notice will have to pay the fine within 14 days or have the matter dealt with by a court. The notices will be used for most offences against the Act, including operating an unlicensed CB radio, possession of an unlicensed transmitter for the purposes of operating it, or for behaving in an antisocial manner on the air. DOTC intends to prosecute the more serious cases through the courts.

The Coil-Winding Wisdom of Solomon

Rob Abel VK2ERA
6 Laurel Street
Kootingal 2352

Commodore 64 Version.

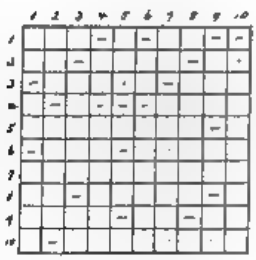
Following the article "Coil Design Made Easy" by Arthur Solomon VK3LJ (AR Nov 1988), a version suitable for Commodore 64 is printed below. I found it to be an extremely useful program and considered it well worth the time and effort to do the conversion for my Commodore 64.

If anyone interested should send me a disk and a suitable SASE, I am willing to provide a copy of the program. ar

```
10 POKE53280,2:POKE53281,6
100 REM *** THE COIL MAKER ***
110 REM A PROGRAMME TO DESIGN AIR-CORED COILS FOR RADIO
120 REM PURPOSES.IT WILL CALCULATE ,GIVEN THE NECESSARY
130 REM PARAMETERS, THE REACTANCE,INDUCTANCE,NUMBER OF
140 REM TURNS AND LENGTH OF WIRE USED IN THE MAKING OF
150 REM SINGLE LAYER AIR-CORED INDUCTORS.
160 REM #### WRITTEN BY ARTHUR SOLOMON,MILBURN,VICTORIA.,1988 ####
170 REM ########## THE COIL-MAKER PROGRAMME ##########
180 PRINT"■"
190 PRINT TAB(6)"### COIL-MAKER PROGRAMME ###"
200 PRINT TAB(6)"=================================="
204 PRINT:PRINT
210 PRINT TAB(3) "SELECT YOUR REQUIREMENT:"
 11 PRINT TAB(3)  ********
212 PRINT:PRINT
220 PRINT TAB(4) "1.CALCULATION OF INDUCTANCE FROM"
221 PRINT TAB(6) "THE REACTANCE"
 30 PRINT TAB(4) "2.CALCULATION OF INDUCTANCE FROM"
232 PRINT TAB(6) "PHYSICAL PARAMETERS"
240 PRINT TAB(4)"3.CALCULATION OF REACTANCE FROM
242 PRINT TAB(6)"THE INDUCTANCE"
250 PRINT TAB(4)"4.CALCULATION OF NUMBER OF TURNS
 60 PRINT TAB(4)"5.CALCULATION OF LENGTH OF WIRE
 70 PRINT TAB(6)"NEEDED"
 80 PRINT TAB(4)"6.EXIT FROM PROG  MME."
    A0$=""
    GET A0$:IF A0$="" THEN PRINT"WHAT IS YOUR CHOI  ":
 90 IF A0$="1" THEN GOTO 360
300 IF A0$="2" THEN GOTO 490
310 IF A0$="3" THEN GOTO 590
320 IF A0$="4" THEN GOTO 640
330 IF A0$="5" THEN GOTO 820
340 IF A0$="6" THEN PRINT"■":POKE53280,14:POKE53281,6:END
360 PRINT"■"
370 PRINT:PRINT TAB(4)"1.  ALCULATION OF INDUCTANCE"
372 PRINT TAB(4)"=  ==========  ========="
374 PRINT TAB(4)"F OM THE REACTANCE"
376 PRINT TAB(4)"=  ==========  ========="
390 PRINT:PRINT TAB(3):INPUT"WHAT IS THE REACTANCE IN OHMS";R1
400 PRINT:PRINT TAB(4):INPUT"WHAT IS THE FREQUENCY IN MHZ ";F1
410 U1=2*π*F1:L=R1/U1
420 PRINT:PRINT TAB(6)"THE INDUCTANCE IS";R1/U1;
430 PRINT:PRINT TAB(6) MICROHENRIES."
440 PRINT:PRINTTAB(5)"DO YOU REQUIRE FURTHER"
442 PRINTTAB(5):INPUT"CALCULATIONS (Y/N)";A0$
450 A0$="X":IF A0$="" THEN GOTO450
460 IF "X"="Y" THEN GOTO 150
470 IF "X"="N"THEN END
480 GOTO 130
490 PRINT"■":PRINT:PRINTTAB(4) CALCULATE OF INDUCTANCE"
492 PRINTTAB(4)"=  ==========  ========="
495 PRINT:PRINT TAB(4)"FROM PHYSICAL PARAMETERS"
496 PRINT TAB(4)"=  ==========  ========="
510 PRINT:PRINTTAB(6)"WHAT IS DIAMETER"
512 PRINTTAB(6):INPUT"OF COIL IN INCHES";D1
520 PRINT:PRINT TAB(6):INPUT"WHAT IS THE NUMBER OF TURNS";T1
530 PRINT:PRINT TAB(6):INPUT"GIVE THE TURNS PER INCH";P1
531 PRINT TAB(6)"OF THE WINDING"
540 A1=D1/2:X1=T1/P1
550 PRINT:PRINTTAB(6)"THEN INDUCTANCE OF YOUR"
552 PRINTTAB(6)"COIL IS";(A1*T1)12/(9*A1+10*X1)"MICROHENRIES"
580 GOTO 440
590 PRINT"■"
```

Solution to Morseword No. 30

Across:	Down:
1 skim,	1 fetes;
2 used,	2 start;
3 bide;	3 rift;
4 rose;	4 does,
5 skite;	5 vain,
6 gob,	6 dots;
7 hare,	7 axia,
8 when;	8 like;
9 evert,	9 daft ,
10 pear	10 dive.



TELL
THE ADVERTISER
YOU SAW IT
IN AMATEUR RADIO

```
590 PRINT "□"
600 PRINT:PRINTTAB(4)"CALCULATION OF REACTANCE:"
610 PRINTTAB(4)"======================="
620 PRINT:PRINTTAB(6)"WHAT IS THE INDUCTANCE"
622 PRINTTAB(6):INPUT"IN MICROHENRIES";L2
630 PRINT:PRINTTAB(6)"WHAT IS THE FREQUENCY"
632 PRINTTAB(6):INPUT"IN MHZ";F1
640 X1=2*π*F1*L2
650 PRINT:PRINTTAB(6)"THE REACTANCE OF THE"
652 PRINTTAB(6)"COIL IS";2*π*F1*L2 "OHMS"
670 GOTO 440
680 PRINT"□"
690 PRINT:PRINTTAB(6)"TO CALCULATE NUMBER OF TURNS"
691 PRINTTAB(6)"========================="
692 PRINT:PRINTTAB(6)" TO OBTAIN GIVEN INDUCTANCE:"
693 PRINTTAB(6)"=========================="
710 PRINT:PRINTTAB(6)"REQUIRED INDUCTANCE"
712 PRINTTAB(6):INPUT"IN MICROHENRIES";L2
720 PRINT:PRINTTAB(6):INPUT"DIAMETER OF FORMER IN INCHES";D0
730 PRINT:PRINTTAB(6):INPUT"TURNS PER INCH OF THE WINDING";T1
740 D1=D0/2:B1=.10*L2)/T1:B2=(10*L2/T1)↑2:C2=2.54*D1↑2*L2:C3=2*D1↑2
750 R2=SQR(B2+C2)
760 IF R2<B1 THEN GOTO 790
770 N1=(B1+R2)/C3
780 GOTO 800
790 N1=(B1-R2)/C3
800 PRINT:PRINTTAB(6)"THE NUMBER OF TURNS";(B1+R2)/C3
810 GOTO 440
820 PRINT"□"
830 PRINT:PRINTTAB(6)"CALCULATION OF LENGTH OF"
832 PRINTTAB(6)"========================="
834 PRINT:PRINTTAB(6)"WIRE NEEDED FOR THE COIL"
836 PRINTTAB(6)"========================="
850 PRINT:PRINTTAB(6):INPUT"DIAMETER OF COIL IN INCHES";D1
860 PRINT:PRINTTAB(6):INPUT"NUMBER OF TURNS";T1
870 PRINT:PRINTTAB(6):INPUT"TURNS PER INCH";X1:B1=T1/X1
880 L1=π*D1*T1:L2=L1/12:L4=L3/3.28
890 PRINT:PRINTTAB(6)"COIL REQUIRES";π*D1*T1/12
892 PRINT TAB(6)"FEET OF WIRE"
900 PRINT:PRINTTAB(6)"NOTE:ADD EXTRA LENGTH TO ALLOW"
902 PRINTTAB(6)"FOR WASTAGE AND INNACCURACY"
904 PRINTTAB(6)"OF MEASUREMENT"
920 GOTO 440
930 END

READY.
```

"IF I GIVE YOU 5 AND 9, WILL YOU SEND ME A QSL CARD?!"

Polarised Plugs . . . The Simple Way

Are you looking for simple, readily available, low-voltage connectors for DC equipment?

Here's a handy suggestion, so obvious that you may not have considered the possibility . . . the conventional 3 pin AC mains plug and socket!

Over the years, I've had a regular need for polarised plugs and sockets in vehicles to operate various pieces of 12V equipment - HF and VHF rigs, lamps, soldering irons, fridges etc

Where cigarette lighter sockets were fitted, they were OK, but these sockets and plugs were not easy to find when I needed to install compatible connectors on the test bench, or to add more temporary equipment during field use. Hence my use of the widely available, low-cost 240V plug and socket.

I achieve a standard polarity system for my equipment by using the earth pin for negative and neutral for positive. Because of the risk that equipment wired with these plugs could be connected by mistake to the power mains, I also jumper the neutral pin to the active in the plug with heavy wire, so that the fuse or breaker will operate if the relevant power outlet is switched on with the DC-style plug inserted. As an extra warning, I mark the plug boldly with a "12 V ONLY" sign.

These plugs and sockets work well, particularly when you wish to draw reasonable current - the paralleling of active and neutral pins gives a minor improvement here, and another advantage of using these connectors is the ease of quick, temporary increased outlets . . . merely plug in a double adaptor!

To give flexible access to various sources of 12 volts in the field, it's worthwhile making up a few different harnesses. They should all terminate in the normal 3 pin socket, but have a variety of input connectors such as heavy duty crocodile clips, accumulator clamps, cigarette lighter plugs (but don't overlook the occasional vehicle with positive grounding) . . . for WICEN members, this is a handy system for going across a range of 12V supplies

Ian Nance VK2BIN
22 Truscott Street
North Ryde 2113

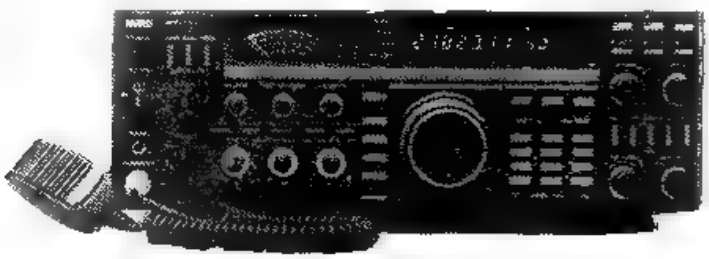
THE GEORGE BUSH, MA
MIKHAIL GORBACHE

What has made Icom's range of transceivers world leaders in their class? Could it be the uncompromising standards of a George Bush? Is it the durability of a Maggie (Iron Lady) Thatcher? Or the innovative thinking of a Mikhail Gorbachev?

It is, in fact, a combination of all three.

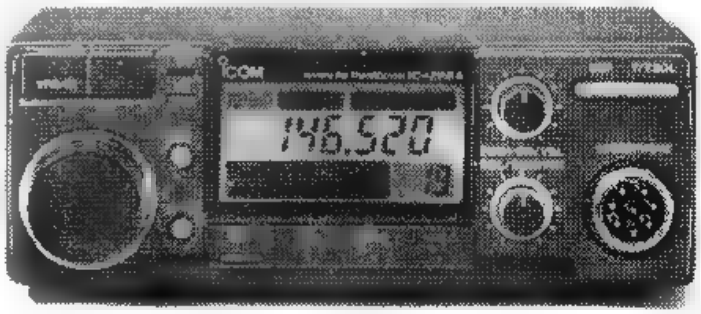
Which has led millions of radio users around the world to choose Icom. Their vote has made Icom the world leader of transceivers.

The Icom IC-725 HF mobile 500KHz-30MHz transceiver is complete with DDS synthesiser, 26 memories (two memories for duplex frequencies), switchable pre-amplifier, scanning, CI-V system for PC control, built in antenna tuner controller and band stacking register.



The Icom IC-765 HF transceiver features DDS synthesiser, high speed auto tuner, built-in AC power supply, 99 programmable memories, keyboard frequency entry, band stacking register, general coverage receiver 100KHz-30MHz, CI-V system for PC control and rack mounting dimensions.

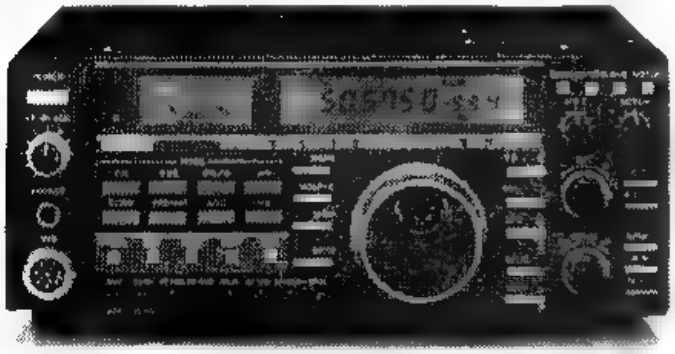
The Icom IC-32AT dual band FM transceiver outputs 5 5W and has a full duplex crossband operation, on/off switchable power saver and 20 double-spaced memory channels that can store two frequencies. The programmed scan function scans all frequencies between two programmable frequencies. And Priority Watch monitors the Call Channel, a memory channel or all the memory channels in succession, every five seconds.



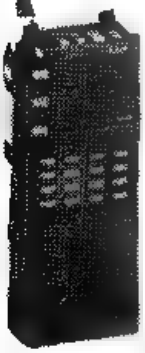
The Icom IC 228A (25W) and IC-228H (45W) mobile FM 144MHz transceivers are compact and easy to operate with 20 memory channels, multi-colour LCD programmed and memory scans, variable tuning steps, priority watch, main controls lit for night operation.

RGARET THATCHER AND V OF TRANSCEIVERS.

The Icom IC-475A (25W) and IC-475H (75W) 430 MHz All Mode transceivers are designed for packet mode with direct digital synthesizer (DDS), 99 memory channels, USB, LSB, CW, FM, passband tuning and adjustable IF notch filter.



The Icom IC-575A (10W) and IC-575H (100W) 28/50 MHz All Mode transceivers have a receiver coverage of 26-56 MHz and are equipped with direct digital synthesizer (DDS), 99 memory channels, and passband tuning



The UHF FM Icom IC-4 GAT with 6 watt output has digital touch step for frequency selection, programmable call channel, LCD readout, optional pager function, programmed and memory scans, automatic power save and 20 memory channels

The Icom IC-275A (25W) and IC-275H (100W) All Mode 144MHz transceivers are designed for packet mode and feature direct digital synthesizer (DDS), 99 memory channels, USB, LSB, CW, FM, and passband tuning.

The palm size Icom-2SA, 144 MHz FM transceiver has 5 watts output with optional BP-85, 48 memory channels and an automatic power saver, LCD readout, operation from battery or external 12V DC supply. A PTT lockout switch is provided to prevent accidental transmissions Options include paging, code squelch functions and beep tone on/off control.

Call Melbourne on (03) 529 7582 or interstate on (008) 338 915 for your nearest Icom stockist.

ICOM

R O 0047

Fatal Distraction

or, Is Amateur Radio a Health Hazard??

Morris Odell
VK3DOC

Most of us will be familiar with the more obvious difficulties associated with our hobby, such as its expense, and demands on time that may not be compatible with other social commitments. In recent years, another concern has become apparent, that of a possible link between exposure to non-ionizing electromagnetic fields and an increased incidence of disease such as cancer and leukaemia.

In writing this article, I have relied partly on material supplied to the WIA by W Ross Adey K6UI, formerly of VK5 who is a prominent research scientist in the biomedical field. I am not concerned here with "acute" effects of RF induction of headaches or personality changes (all of which have been reported at one time or another) but in long term effects, possibly leading to diseases such as cancer.

Before discussing the current state of understanding on this large and complicated subject, it will be necessary to explain some of the terms used, as well as the method by which results are obtained.

The nature of the effects under investigation is such that there is no simple experiment that can be done in order to definitely settle the matter. One cannot put a person in a field under laboratory conditions, and the results from animal experiments of these type are not necessarily applicable to the human condition. This is not to say that experimentation is worthless, but its main use can only be to help interpret results observed in the field.

For "bottom line" information then, we must look at epidemiological studies which is a fancy way of describing studies that look at people exposed to suspected dangers and statistically comparing their rates of disease and death with that of the general population. This is not as simple a task as may seem, since people are exposed to a wide range of environmental influences and separating the effect of each one statistically takes a lot of work and needs a large number of people to be studied, especially if the effect you are looking for is very weak.

It is also necessary to know what we are talking about when we mention "non-ionizing radiation". We know from physics that electromagnetic waves carry energy in proportion to their frequency. Above a certain frequency (approximately in the ultraviolet region) the energy carried is sufficient to ionize atoms and thus cause direct damage to chemical substances within the living cell. This extends up through the spectrum and is responsible for the well-known biological effects of X-Rays, Gamma Rays and the like. What we are concerned with here is radiation in the very low frequency, radio and microwave part of the spectrum where the effects on living tissue are much more subtle, being due to local heating or interference with electric fields in cell membranes rather than direct molecular damage.

Finally, we also need to understand a little about theories of carcinogenesis or how environmental factors bring about cancer. Carcinogenic influences may be initiators or promoters. Initiators cause the process of malignant change to begin in previously normal tissues, although the end result may not be apparent for years after the exposure. Good examples of initiators are asbestos dust and ionizing radiation. Promoters act on tissue that has previously been initiated or undergone pre-malignant change, and speed up the progression to cancerous growth. Many natural and human made substances act as either initiators or promoters of carcinogenesis, and some, such as tobacco smoke, are thought to have a mixed action.

In any population exposed to a promoter, it would be expected that the incidence of cancer would increase with age as we all accumulate subtle damage to our cells from natural sources such as cosmic rays as well as the effects of ageing on the accuracy of genetic transfer in dividing cells. A complete discussion of how this takes place is beyond the scope of an article such as this, but it can briefly be described as a breakdown in the biochemical systems that control cell growth, both from within the cell and by chemical messages from other cells.

Another way in which cancer can be promoted is by effects on the immune system of the body, one of whose functions is to "patrol" for early cancers and eradicate them. Some test tube studies have shown an effect of RF fields on the function of lymphocytes (the cells of the immune system), but this is very difficult to test in the living body. Moreover, the cancers that have been observed in the epidemiological studies described here are not the same as those that appear in other deficiencies of the immune system such as AIDS.

Epidemiological Studies

A number of epidemiological studies have examined people exposed to non-ionizing radiation, both at RF and power line frequencies and although there have been difficulties with getting a "pure" sample, it seems that RF exposure may act as a weak promoter of some types of cancer.

A study that aroused some concern amongst the amateur community was one done on a sample of American radio amateurs. This was done by correlating the FCC file of known amateurs with death certificate statistics regarding cause of death. It was found that, while radio amateurs had a low death rate for their age (as would be expected from their higher level of education and social class), there was a significant increase in the incidence of a particular form of leukaemia known as AML and of all types of lymphoma (cancer of the lymphatic system). A possible confounding factor, however, was that 31% of the amateurs had occupational exposure to electromagnetic fields as well.

These results lead us to look at studies of people involved in the electronics industry or exposed to such radiation in the course of their work. One such study looked at occupations given on death certificates which "intuitively" involved exposure to non-ionizing electromagnetic fields, and correlated them with causes of death. (By "intuitively" they mean that the investigators thought there was a likelihood of exposure rather than directly measuring it). Occupations included radio and electronics workers as well as power station workers, projectionists, welders and people involved in the aluminium refining industry. This study also found an increase in AML and some types of lymphoma, but qualified the results because of the impossibility determining such variables as duration of exposure, field strength and type, and most importantly, the presence of other substances such as welding

fumes, ozone, aluminium fumes and polycyclic carbon compounds from burning carbon electrodes (which are also known to be one of the main carcinogenic components of tobacco smoke).

A study of brain tumour mortality found an increased risk (relative risk of 2.3 times compared to the general population) in RF-exposed men involved in the design, manufacture, repair or installation of electronic equipment, but RF-exposed men in other industries had normal risk. The risk was later also found to be increased in workers in the industry not exposed to RF fields. The risk increased by a factor of 10 after 20 years of exposure, and raises the possibility of carcinogenic effects from solder fumes, solvents and other chemicals involved in the industry.

Conclusion

What does all this mean? It should be realised that the risks we are talking about here are very small compared to other significant dangers that exist in our society, such as dying in motor accident or of heart disease. They have also to be seen in the context of an ageing amateur population (average age in Australia is 51 years) many of whom have been employed in technical occupations for 30 years or more and involving exposure to many other possible carcinogens. For the typical "ham" who spends a few hours a week on the air or fiddling with equipment, living in an environment which includes electromagnetic fields from domestic appliances and power wiring and exposed to the ever increasing chemical pollution of our society, the chance of dying as a result of his relatively innocent pastime is miniscule. So don't throw away the transceiver or the soldering iron just yet. Enjoy the pleasures of our magnificent hobby without worrying whether it will kill you!

JOTA - 1989

Peter Hughes VK6HU
58 Preston Street
Como 6152

This information may be useful to operators new to JOTA and perhaps as a look-up for those previously involved.

What?

The 32nd Jamboree-on-the-Air is a weekend during which Radio Amateurs invite Scouts and Guides to talk "on air" to other Scouts and Guides. It may be to overseas, across Australia, or just over the back fence.

When?

From 0001 hrs Local Time Saturday October 21st, to 2359 hrs Sunday October 22nd - for any period(s) to suit the operator. An explanation that this means that all JOTA stations could be on air together for 24 hours (and only 24) is quite interesting.

How?

Operation can be from the shack, a Scout or Guide Hall, at a District or Area Field Day or (for the very keen) enjoying the great fun at a camp.

Any mode or frequency within the operator's licence may be employed and Scouts and Guides are allowed to speak directly on the mike. It is useful to explain that this privilege has been available to our young people since the inception of JOTA, by courtesy of DOTC, but it is not so in all countries.

Regulations require that all "Club" stations keep a Log, and this practice is wise for special event stations anyway. A simplified Scout or Guide Log (which they bring with them) is required from them for statistics for the World Report. Some assistance with this, and a signature on completion, would be appreciated.

Your visitors are expected to assist with carrying equipment, erection of antennae if needed, victualling and their own supervision for discipline. They may assist with your Log keeping if you so desire. You may use your own QSL Cards or some which they may make themselves or purchase from some headquarters.

A copy of the list of Phonetics and a "translation" of the Q Code has been published for their use, as has the following, but these may not be brought with them.

Frequencies:

To facilitate contacts, the following have been agreed as:

WORLD SCOUT CALLING FREQUENCIES

Band	DX CW	DX Phone	VK Phone
80 metres	3.590 MHz	3.740 MHz	3.590 MHz
40 metres	7.030 MHz	7.090 MHz	7.090 MHz
20 metres	14.070 MHz	14.290 MHz	14.190 MHz
15 metres	21.140 MHz	21.360 MHz	21.190 MHz
10 metres	28.190 MHz	28.990 MHz	*28.590 MHz

(* recently changed)

World Bureau recommendation is for stations to call "CQ Jamboree" or answer such a call on one to those frequencies then QSY to maintain the contact and free the calling spot. In practice, however, the contact is easily lost in the shift so it has been found better to "edge" the QRM to call and answer without any need to QSY.

National Broadcast

At the time of preparing this article, it is expected that I will again perform the traditional National JOTA Opening Broadcast, but details of site and personalities to be involved are yet unknown. I hope to have later information on WIA News Broadcasts, but the following should be enough:

The National JOTA Opening Ceremony will broadcast on 7.090 MHz, 14.190 MHz and 21.190 MHz at 0400Z on Saturday October 21st 1989. Tests for propagation conditions will occur periodically as antennas and gear are set up, and generally commence solidly about 0330Z. A callback will be taken on the frequencies in turn after the official speeches and, depending on response, bands will be accessed more than once, as announced. It has been our practice in recent years to keep all transmissions active, to allow those just listening to hear callbacks on the other bands.

It would be appreciated if all these frequencies could be left clear during the test, broadcast and callback. It is especially important that supervision eliminates incessant calling of "CQ" at this time - or at any other time for that matter!

Your State may also have an official broadcast which may be advised in the WIA News, so the same conditions will apply to that broadcast as above.

The logo, shown at the start of this article, is a design by Jeroen Lindeboom, of the Netherlands and is in recognition of the participation of Guides in JOTA for so many years. It shows a Guide on a rope-ladder attached to a simple tower with a transmitter ar

PAC-COMM

Amateur Radio Equipment

Packet radio controllers, digipeaters, packet terminal software and accessories

TINY-2
MICROPOWER-2
TNC-220
DR-100 DR-200
MACKET
MAXPAK-64
PC-100

NEW
Transceiver Remote Controller & 9600 baud modem

BLAMAC PTY LTD,
P.O. BOX 57, Cooma,
NSW 2630
26B Bombala Street, Cooma, 2630 NSW
Phone 064-523112
Fax 064-524317

Claude Singleton VK4UX

Cyclone Tracy TV Drama Gets It Wrong

Jim Linton
VK3PC

The TV dramatisation of the Cyclone Tracy disaster failed to give radio amateurs the recognition they deserved. That is the firm view of Claude Singleton VK4UX who was involved in the emergency communications the day after Tracy devastated Darwin on Christmas Day, 1974. Virtually the only communications for many hours with Darwin after the cyclone was via a radio amateur in the ruins, Slim Jones VK8JT and Ken McLachlan VK3AH in Melbourne. The story of Cyclone Tracy was published in AR magazine to mark the disaster's 10th Anniversary.

Claude said that he helped relay some traffic when transmissions between VK8JT and VK3AH became difficult. He said that the TV dramatisation of the disaster which is still being seen around Australia did not sufficiently recognise the role played by amateur radio. "I'm a bit bitter about the lack of publicity amateurs get after every disaster," Claude said.

"Although the TV series gave radio amateurs the credit for keeping communications open, it under-played the difficulties experienced by Slim Jones," he said.

The viewing public saw a radio amateur transmitting in an office protected from the wind and rain. But what actually happened was that Slim operated from a bathroom, the only room left of his demolished home, Claude said

"They didn't have it deliberately wrong and apart from that it was an accurate series; it's just we always get so little publicity for the work we do," he said.

SUBSCRIBE SUBSCRIBE SUBSCRIBE

New column on computer hardware

Police radar: it's not always right
Intelligent charger for 12V gel batteries

Have SILICON CHIP delivered direct to your door at no additional cost.

Each month, we'll bring you the best and brightest electronics magazine, put together by Australia's most experienced team.

- CONSTRUCTIONAL PROJECTS
- AMATEUR RADIO
- VINTAGE RADIO
- COMPUTER BITS
- THE WAY I SEE IT
- INFORMATIVE ELECTRONIC STORIES

COMPLETE THIS COUPON

24 Hour Fax Service
(02) 982 9553
Send the coupon with your Credit Card details
24 Hours, 7 Days a week

Subscription Hotline
Telephone (02) 982 3935
9am-5pm Mon-Fri
and quote your Bankcard, Visa Card or MasterCard No and expiry date

Detach Coupon and Mail to:
FREEPOST 25
SILICON CHIP PUBLICATIONS
PO BOX 139
COLLAROY BEACH
NSW 2097
***No postage stamp required in Australia.**

FREEPOST* SUBSCRIPTION COUPON

☐ New subscription ☐ Renewal Start in_____

Name_____
(PLEASE PRINT)

Street_____

Suburb/town_____ Postcode_____

	1 year (12 issues)	2 years (24 issues)
Australia	☐ $A42	☐ $A84
NZ & PNG (airmail)	☐ $A65	☐ $A130
Overseas surface mail	☐ $A62	☐ $A130
Overseas airmail	☐ $A120	$A240

Enclosed is my cheque/money order for $_____ or please debit my
☐ Bankcard ☐ Visa Card ☐ MasterCard

Card No. | | | | | | | | | | | | | | | | |

Signature _____ Card expiry date ____/____/____

HOW'S DX?

People's Democratic Republic of Yemen

Patrick Kelly VK2RZ
PO Box 41
Ourimbah 2258

This was going to be my big DX story for this month. Unfortunately 7O did not eventuate and because it is about number three on the most wanted DXCC countries list, this expedition was being eagerly awaited.

Now the lead up to this started in early July. Paul I1RBJ announced his intention to operate as either I1RBJ/7O or 7O1A from July 22-26. Then, just a day or so before Paul was due to leave for South Yemen there were reports that he had received threatening letters and telephone calls putting the trip in doubt.

July 22 came and went, 7O was cancelled. An unconfirmed report said that Paul had gone to Somalia, but was refused permission to travel to Aden. Rumour has it that the same to two Middle East Amateurs who did their nasty work on Hans 4W0PA, were again involved.

Yet another unconfirmed report was about a certain OE operator having said on air that Paul would be put in jail immediately if he did go to 7O. This same operator is said to have had inside information concerning the arrest of Hans 4W0PA in North Yemen and has been accused by some of having set it up.

Just what we are supposed to make of all this is beyond me.

Bouvet Island

Einar LA1EE has announced a DXpedition to 3Y to start around next Christmas. This is definitely rare DX so what better gift could you give a DXer? More details about this will emerge over the coming months - this is just a warning! Right in the middle of the school holidays too which could present a problem for some.

Frederick Reef

An international group of DXers including Harry VK2BJL plan to operate as VK9FR in October. The reef is located 200 miles south-west of Mellish Reef and almost due east of MacKay Queensland. An appreciation for DXCC status has been sent to the ARRL for consideration.

La Blanquilla Island

I worked YY5LB on ten metres on the last day of operation by the Venezuelan Navy. The occasion was to celebrate Navy Day, and there are special awards for the first five stations to work them on three bands. Certificates are also available for anyone else who worked them on three bands. Activity was from July 19-22 on 160-10 metres, CW, SSB and RTTY. For I0 TA awards this one is SA37. QSL to Radio Club Venezolano, Box 2285, Caracas 101-A, Venezuela. Via the bureau is OK.

Conway Reef

Pekka OH1RY, Vili OH2BAZ, OH2BGD and OH2VB will operate as 3D2RY from November 3-13. It is not unusual to hear Pekka and Vili each year around this time from several Pacific islands. I'm not sure where they will be for the CQWW contest, possibly YJ and 3D2.

Liberia

While looking for TJ1MW I had the pleasure of meeting up with Bill, 6Z2WK (EL2WK) and his XYL Doreen 6Z2DK (EL2DK) on 28.596 MHz at 0750Z. They also checked in regularly on 14.222 MHz at 0530Z, and it was nice to hear them both giving reports for each contact. The QSL route is via G3OCA. This is different to what I had previously been given, as all 6Z QSLs were supposed to go to Robert F Wynhoff, 12915 Memorial Drive, Houston, TX 77079 USA.

The 6Z is a special prefix that was used during July to celebrate the 142nd anniversary of the independence of the Republic of Liberia. An award is available for Amateurs and SWLs who have worked or heard five separate stations with the 6Z prefix. A certified log extract by two licensed Amateurs is all that is required. Cost of the award is US$5.00 or ten IRCs. Send to the LRAA Awards Manager, PO Box 10-0987, 1000 Monrovia 10, Liberia, West Africa.

Kure Island

KH6LW/KH7 has been active recently and Rick KH6JEB/KH7 is a regular here. Most operations are fairly brief, sometimes amounting to just a few hours on each visit. Low band operation is not possible due to a Loran station situated there. QSLs for both to KH6JEB.

Guantanamo Bay

Peter KG4UN was here for two weeks. QSL to K8UNP.

Sovereign Military Order of Malta

1A0KM is operated by the International Committee of Radio Amateurs for Unicef. This is the only callsign for SMOM and there have been reports of pirate operations recently using a different call. I worked 1A0KM on the 1st of October 1988, and apparently there has not been any official operation since.

Founded in 1099 AD the SMOM was recognised by Pope Paschall II in 1113. From 1310 to 1522 the Order maintained sovereignty on the island of Rhodes and from 1530 to 1798 on the island of Malta. Then, in 1834 the Order made its final move to Italy where it now holds several sovereign territories in Rome.

The SMOM is ruled over by the Prince and Grand Master of the Order and its members are known as the Knights of Rhodes and Malta. Under international law, the Order maintains diplomatic relations with many countries, as well as with the main international organisations. With a glorious history, the SMOM continues its ancient tradition in providing medical, financial and social aid.

A beautiful photograph of an ancient four storey building with palm trees and high manicured hedges in the foreground adorns the QSL card of 1A0KM. Incongruously, a three element tri-bander flanks a small rooftop tower, from which a red flag with its white Maltese Cross proudly flies from a pole against a perfect sky.

The QSL route for CW is to I0JX, SSB to I0IJ and for RTTY to I0AOF.

United Nations

I regularly come across 4U1UN on the higher frequencies. The station is in the United Nations Building in New York and may be operated by visiting amateurs. QSL to NA2K.

ITU Geneva

Another DXCC country in a logbook is 4U1ITU. I worked Paul I1RBJ on July 7 on 20 metres, just two weeks before his 7O operation was to start. Paul asked for QSLs to his home-call. Usually QSLs are via the bureau only, but it is OK to send to individual operators.

Amsterdam Island

Michel FT4ZE is now active from this desolate island in the Southern Indian Ocean. QSL to F2CW.

YLs in 3D2 and FW

Alice N4DDK, MaryLou NM7N, Audrey N7HAT and Mary KA0OMX signed FW/ from July 6-13. All except N7HAT then operated with their own 3D2 calls from July 13-21. They worked 40-10 metres CW and SSB and I only managed one contact on 15 metres with MaryLou as 3D2MB. QSLs for both locations are being handled by Elizabeth, VE7YL.

Mongolia

More activity here in Zone 23. This time from JT9C and JT1BJ/JT9 which is the first time I have heard this call area activated, wherever it is! The operation was from July 18-28 on 80-10 metres. QSL to PO Box 124, Ulan Bator 51, Mongolia.

USSR News

- From April 1 to Jun 29 UZ9AWD operated/ UH1A/UH1W/UI1Z and /UL1I. QSL to UA9AQN, Box 49, Magnitogorsk, 455044, USSR.
- RB8M is a contest callsign and will be used for WPX, IARU and CQWW contests. QSL to Box 59, Lisichensk, 349900, USSR.
- RT4UM/RG1G was active during March and April. QSL to Box 55, Kiev 91, 252091, USSR.
- UA1POL/1 on Waigach Is has been active since March 10. QSL to Box 49, Arkhangelsk,

163040, USSR.
- From February 23 to March 4, the following were all active. UZ9WWA/UD9D/UH1A/UH1H and /UH1E. UV9WN/UD4D/UH2A/UH3H and /UH4E. RW9WA/RH2A/RH3H and/RH4E QSLs to RW9WA and UZ9WWA, Box 7056, UFA 75, 4550075, USSR. For UV9WN to Box 139, UFA 38, 450038, USSR. UA0UBG/UA8V will be active to October 1, on all bands CW/SSB QSL to UA0UBE, Box 308, Chita 5, 672005, USSR
- 4K0AAD QSL to UA3DAP, Box 17, Podolsk 17, 142117, USSR
- EU2AR to Box 33, Minsk, 220013, USSR.
- EU2HZ to Box 80, Minsk, 83220083, USSR.
- RA3YF/RJ0K to Box 27, Bryansk, 241000, USSR.
- UB4MM/RY0K to Box 73, Lisichensk, 349918, USSR.
- UZ9MWJ/UZ0K to Box 1353, Omsk, 644093, USSR
- EV7DN to RB51J, Box 1, Enakiewo 29, 349820, USSR.

All the above information was supplied by the Prometheus Amateur Association Inc.

QSL Information

FH5EF - F6ESV
IM0AEQ - IS0AEQ
(Rossa Is)
KC4AAA - NC6J
(McMurdo Station)
KX6HE K2CL
LX1RQ - SP5SJD
[illegible]
TK/PA3EBT - PA1OW
[illegible]
TV7E - F6HUJ
UG6GAW - C/B or Bureau
UH8EA C/B or Bureau
UI8ZAA - C/B or Bureau
UM8MDX - C/B or Bureau
UY9ILK - UY5EG
XE2PBA - KB7HUG
XF4F - WA3HUP
4M5A - YV5AJ
9J2BO W6ORD
D68CY - Box 85, Moroni, Comoros Is, Indian Ocean
T30MT - Mote Terukaio, Box 72, Bairiki, Tarawa, Republic of Kiribati
TR8RF - Box 5487, Libreville, Gabon, West Africa
UC20AV - Box 49, Gomel, 246049, USSR
UH9WWA - Box 104, Penza, 440600, USSR

Other Bits and Pieces

▼ One station I omitted from my report on Antarctica was Ted VK0IC, who was also active during 1988. I remember working Ted on fifteen metres one Sunday afternoon. He is now back home as VK1BL and would like all those waiting for QSL to know that he has started to clear the backlog. The QSL address is Ted Garnett, GPO Box 1164, Canberra, ACT 2601

▼ As from June 24, Burma XZ became officially known as Myanmar and the capital Rangoon became Yangon. I'm devastated!

▼ It is almost certain that the logs for 3V8AZ and 3V8VA were lost in the plane crash that claimed the lives of Marcel F2SA and Henri F1HJW who were the operators.

▼ By now the prefixes for both KC6 call areas should have changed to V63. The KX6 prefix was also due to change to V73.

▼ T30 stations were preceding their suffixes with "X" in July to celebrate ten years of independence.

▼ From July 1 to November 30, 9V1 stations will be signing 9V0 to mark the 1989 Seanet Convention

My thanks for their information to VK2's HD, HF, PS, FR and to VK4AIX.
See you in the pile ups.
Good DX!

VHF/UHF

An Expanding World

Eric Jamieson VK5LP
9 West Terrace
Meningie 5264

All times are universal Time Coordinated indicated as UTC

Beacons on Six Metres

Freq.	Call sign	Location	Grid square
50.000	GB3BUX	England	IO73
50.005	H44HIR	Honiara	QI00
50.005	ZS2SIX	South Africa	KF25
50.011	JA2IGY	Japan	PM84
50.015	SZ2DH	Greece	KM18
50.017	JA6ZIH	Japan	PM51
50.020	GB3SIX	England	IO73
50.020	CS1CCC	Uraguay	
50.025	6Y5RC	Jamaica	FK17
50.028	JA7ZMA	Japan	QM07
50.029	CT0WW	Portugal	IN61
50.032	ZD8VHF	Ascension Island	II22
50.035	ZB2VHF	Gibraltar	IM76
50.035	ZS3VHF	South Africa	JG87
50.039	FY7THF	French Guyana	GJ35
50.045	OX3VHF	Greenland	GP60
50.048	TF4BFK	Guatemala	
50.050	GB3NHQ	England	IO91
50.050	ZS6DN	South Africa	KG44
50.056	VK8VF	Darwin	PH57
50.057	TF3SIX	Iceland	HP94
50.062	PY2AA	Brazil	GG66
50.064	WD7Z	Arizona	EL59
50.065	GJ4HXJ	England	IN89
50.065	NB3O/1	Rhode Island	FN41
50.066	VK6RPR	Perth	OF78
50.063	KH6HI	Hawaii	BL01
50.075	VS6SIX	Hong Kong	OL72
50.078	TI2NA	Costa Rica	EK70
50.080	KH6JJK	Hawaii	BL11
50.080	HC8SIX	Galapagos Is	EI59
50.085	9H1SIX	Malta	JM75
50.086	VP2MO	Montserrat	FK86
50.088	VE1SIX	Canada	FN65
50.090	KJ6BZ	Johnston Is	AK56
50.092	W5GTP	Louisiana USA	EM40
50.099	KP4EKG	Puerto Rico	FK68
50.100	HC2FG	Ecuador	FI07
50.100	5H1HK	Tanzania	
50.110	KG6DX	Guam	QK23
50.110	A61XL	United Arab Emir	LL74
50.120	4S7EA	Sri Lanka	MJ97
50.321	ZS5SIX	South Africa	KG50
50.490	JG1ZGW	Tokyo	PM95
50.499	5B4CY	Cyprus	KM54
52.100	ZK2SIX	Niue	AH50
52.200	VK8VF	Darwin	PH57
52.310	ZL3MHF	Christchurch	RE66
52.320	VK6RTT	Wickham	OG89
52.325	VK2RHV	Newcastle	QF57
52.330	VK3RGG	Geelong	QF21
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.435	VK3RMV	Hamilton	QF12
52.440	VK4RTL	Townsville	QG30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.460	VK6RPH	Perth	OF78
52.465	VK6RTW	Albany	OF84
52.470	VK7RNT	Launceston	QE38
52.485	VK8RAS	Alice Springs	PG66
52.510	ZL2MHF	Mount Climie	RE78

There are no changes to the six metre beacon list since it was last published in June

Six Metres

The band has been very quiet during the past month. There were a few Es openings with one of the best possibly on 8/7, when contacts were made to VK2, 4 and 6. At 0620 Peter VK6KXW was 5x9 and with the beam on the west Lance VK4ZAZ broke in with an S5 signal, so the band was in good shape. VK2 and 4 were in again on 15/7 and no doubt there have been others between the various States.

The Japanese "CQ ham radio" magazine (courtesy VK6RO) includes a list of the following six metre stations, which were worked from that country between 20/3 and 20/4 and it makes interesting reading. They include. BY4RB, ZK1XH, 5W1HS, VK8ZLX, VK4FNQ, ZL2KT, PY21AX, ZD8MB, VK9NS, VK5NY, FK1KT, VK30T, KX6DS, P29PL, H44GR, KH6HI, XX9KA, VS6XRC, YC0UVO, V85DA, VK6ZRT, HL1ES, KG6DX, VQ9QM, 4SNMR,5H1HK, 9H1BT, ZS6WB, SV1AB, CX4HS, VK2QF, 3D2ER, FO5DR, KP4EOR, S79M, T3ODJ, HC2FG, K6STI, HP3SUH, LU8MBL, CE3BFZ, KB6FIQ/DU3, 4F3BAA, TI2KD, OA8ABT, PP5WL, VK1RX, AH9AC, OE3OK, 4GIA/3, T20JT, ZL7TPY, and VK7LZ.

All Australian and New Zealand call areas were worked, and apart from these the above list shows only one call sign from each country. Obviously many more stations from those areas were worked; in fact, there are three 4S7s listed and several more from ZS6 from a list of 300 contacts, so the Japanese signals have encompassed large areas of the globe. However, it would appear they have not been so successful as VK when it comes to working stations in the Caribbean area, despite the above list representing 46 countries.

There are a few rather interesting contacts in the above list, one being S79M, which appears to have been a DXpedition by JR4PMX between 19/3 and 29/3, and was a CW contact from the Seychelles to JR6HI and probably others.

ANTENNAS & ACCESSORIES

We manufacture a comprehensive range of HF, VHF and UHF antennas, baluns, power dividers, etc. to suit your application.
Three of our log periodics provide continuous coverage from 13-30 MHz including WARC frequencies and replace outdated tribanders. Now in use in 24 overseas countries and 6 continents.

- CREATE ROTATORS, COAX CABLES & NON-CONDUCTING GUY HALYARD MATERIALS
- COMPLETE RANGE MIRAGE (USA) 5 YR WARRANTY 6M, 2M, 70CM AMPS & WATT [illegible] METERS
- HARD-DRAWN ANTENNA WIRE
- AUST/NZ DISTRIBUTOR FOR CREATE ANTENNAS/ROTATORS & PHYLYSTRAN (KEVLAR) NON-CONDUCTING GUYING [illegible]
- HIGH GAIN VHF & UHF AMATEUR, SCANNING & TV ANTENNAS
- BUTT SECTION TRIANGULAR ALUMINIUM TOWERS FOR FIXED OR TILT OVER APPLICATIONS (REFER MARCH/APRIL 1987 AR)
- SELECTION OF POWER CHIPS AT FRIENDLY PRICES
- VSWR/PWR METERS TO 1300MHz

Write or phone for free Catalogue

ATN ANTENNAS

56 Campbell Street,
Birchip, Vic. 3483
Phone: (054) 92 2224
Fax: (054) 92 2666

The Six Metre Beacons

In due course, some thought will need to be given to the operating frequencies of the six metre beacons. At present, most are located on 52 MHz, where they continue to serve a purpose, but perhaps not so usefully as before the availability of the 50 MHz segment of the band.

Any changes in frequency need to take into account that the eastern States are limited to between 50.050 and 50.200, and with radius restrictions. Therefore, they cannot be simply brought down in frequency by 2 MHz, as some have suggested, as they would be above the 50.200 limitation.

If our beacons were located in a segment, say between 50.050 and 50.070, at times they may be a nuisance to overseas beacons, although I am not sure how many of those that may be monitored lead to contacts, as most surveillance seems to take place on 50 110 or thereabouts. However, that aspect must be considered as it also works in reverse, our beacons may not be heard overseas if they are mixed with their beacons.

Perhaps they would be best situated in a 20 kHz segment between 50.150 and 50.200 MHz. I am suggesting a 20 kHz space as at present, and with some care in planning, mutual interference could be kept to a minimum, except for perhaps days of intense Es, when the whole of Australia is open anyway. The USA beacons seem to exist with about 20 kHz, except for those who choose to randomly operate in other sections of the band.

I would be pleased to receive some feedback from those with an interest in beacons. You might consider looking at the current Australian six metre list, and suggesting how the portion of the band you nominate may accommodate the beacons, and what frequencies you would assign to which beacon, having regard for their present locations and the possibility of mutual interference to other beacons at a time of enhanced propagation. I think it is possible that the time has gone when we can continue to place the beacons in readily identified frequency segments; each beacon will need to be placed according to what effect it has on those near it in frequency under all conditions. Please write!

QSL Information

AH9AC: I8YCP, Cristina Pellechia, S Giacomo d Capri 69, 1-80131 Napoli, Italy.
A35IC: via JJ2ICA
C21RK: via JJ1TZK
CE3BFZ: Pedora Barrosa Vivaldi, Pint Magdalene Mire 7763, Las Condes, Chile.
CE3XK: Renato C Carvajal Reeves, Jose Zapiola 7693, G. La Reina, Chile.
CX1DDO: Amador Tannino, Columbia y San Francisco, Shangria, Canelones, Uruguay.
FO4NK: Alain Salic, SP91381, F 75996, Paris Armees, France
FO5DR: Rene Delamare, Box 11078, Mahina, Tahiti.
P29PL: VK9NS, J B Smith, Box 90, Norfolk Island, 2899.
SV1AB: Giorgos Vernardakis, Markoy Botsari 72, GR-14561 Kifisia, Greece.
T20AA: N4FJL Thomas G Schreckengost, 8W Pine Tree Avenue, Lake Worth Florida 33463, USA.
T20JT/T30DJ: W6JKV, James G Treybig, 27200 Altamont Rd, Los Altos Hills, CA94022, USA.
VK9YQS/0: VK3OT, Stephen R Gregory, PO Box 622, Hamilton, Victoria, 3300
VQ9QM: W4QM, Harmon D Strieter, 928 Trinadad, Cocoa Beach, Florida 32931, USA
XX9KA: KC9V, Betty L Collins, Box 263, State Line, Indiana, 47982, USA.
ZD8MB: Box 1, Ascension Is, via UK
ZK1XH: via JR1FYS
ZK1WL: Warwick Latham, Penrhyn I, Cook Island, New Zealand
ZL7TPY: ZL2TPY, K W Mundell, 6 Alberta Road, New Plymouth, 4601, New [illegible]
3D2AG: Box 184, Suva, Fiji Is.
4G1A: via JF2IHZ
4F3BAA: via JG2PUW
5H1HK: via JH4RHF
5W1GW: via JA8IYK via Buro
5W1HQ: via JJ3IMX
8Q7TT: via JF2KOZ

The above courtesy of "CQ ham radio"

P43AS: Juan Nogueroa, PO Box 2380,Rool Koochi 56-D, Aruba, Dutch Caribbean.
ZF1RC: Roger Corbin, PO Box 1549, Cayman Is, West Indies.

A card from OY7ML of the Faroe Islands says that at present no six metre operating is permitted in that country. OY9JD has made some crossband 10 to 6 metre contacts, and has applied for a six metre licence, but may be unable to commence operating before September/October 1989.

Two Metres and Above

Perhaps other areas have been more active but the VK5 scene has been rather dismal for some time on these bands. On two occasions at around 1100 I was surprised to hear the 432.535 beacon VK3RMB with slow QSB, but with signals peaking to S3 on occasions.

On 144.550 VK5RSE from Mount Gambier is consistently around S5 and dropping down under extremely poor conditions. During the winter months, I have been surprised how many times the repeaters are available from Naracoorte in our South East and from Mount William in Victoria. For FM I use a stacked Ringo type antenna, with a gain of about 5 dB fed with ET13M 75 ohm coax, and obviously the system is working well. It may be helped by the fact that the top of the antenna is 95 feet above ground!

Apart from the above, there is little else to write about. Perhaps this saving of space will be placed to my credit for use when six metres opens up in September!

Closure

Closing with two thoughts for the month: "Worry is the traitor in our camp that dampens our powder and weakens our aim", and "The most important thing a father can do for his children is to love their mother". 73

The Voice by the Lake

ar

CONTESTS

Calendar, John Moyle Results VK-ZL-Oceania Rules

Federal Contest Manager
Frank Beech VK7BC
37 Nobelius Dr
Legana TAS 7277

Contest Calendar

September

3rd LZ Bulgarian DX SW contest
16-17 Scandinavian CW contest
23-24 Scandinavian SSB contest.
Rules for above 3 contests in Aug "AR".

October

7-8th VK/ZL Oceania DX Contest SSB Section (Rules this issue)
8th RSGB 21/28 MHz SSB contest
9th RSGB 28 MHz contest
14-15th VK/ZL Oceania DX Contest CW Section (Rules this issue)
15th RSGB 21 MHz CW Contest

1988 Ross Hull Memorial Contest

After checking my copy of the results of this last contest against a copy of "AR" it became apparent that the score obtained by John VK3ZJC was missing. In the contest John was in fourth place with 1591 points from 191 contacts, congratulations on a very good score.

Whilst dealing with our Mr Murphy, in the results of the 1988 Remembrance day contest the score of VK6HU was omitted from the HF phone results. Please insert VK6HU 98 points in the HF phone section

John Moyle Memorial Field Day Contest 1989 Results

Entries have been scrutinised, and all sections apart from "G" and "J" received support. With one exception all entries complied fully with the rules as laid down, and the standard of logs submitted was very high, which has made the work of the FCM relatively painless Thank you. Certificates will be issued in the near future, as will the trophy for the best CW score/effort.

1989 Australian Novice Contest Results

Section "A"

VK5NOD	815 points		cert
VK4WIH	805	"	
VK1PJ	794	"	cert
ZL1BVK	751	"	cert
VK1NEB	707	"	cert
VK4VMP	698	"	cert
VK3PTB	622	"	cert
VK5NVW	596	"	cert
VK4NEF	559	"	
VK2PSD	474	"	cert
VK3AJU	431	"	
VK5QX	427	"	
VK6ANC	421	"	
VK5NPF/3	411	"	
VK3BMU	403	"	
VK4BB	397	"	
VK2CKW	319	"	
VK2ZL	261	"	
ZM3KR	243	"	
VK7HX	231	"	
VK4NFE	206	"	
ZM1IM	183	"	
VK5UE	178	"	
VK7NBO	172	"	cert
VK6NCH	143	"	cert
VK1BBA	113	"	
VK6JMP/p	73	"	cert

Section "B" CW

VK5NOD	46 points		
VK5AGX	38	"	

Certificates for the winning stations will be distributed at an early date, the standard of logs received was very good and no problems with presentations occured. It was disappointing to see such a poor support for the CW mode, and the lack of support by the Australian novices for even the phone section is deplorable. Maybe they are all studying for the full call, or perhaps are all on 2 metres FM!

John Moyle Memorial National Field Day Contest 1989 Results

DIVISION "A" 24 HOUR

Section "A" Portable field station single op.

VK3AJU	9069 points	
VK6NTJ	8662	"

Section "B" Portable TX CW, S op.

VK3CR	696 points	10 watts input wind power.

Section "C" Portable TX Open, S op.

VK4EV	363 points	

Section "D" Portable TX phone, multiple op.

VK4IZ	12323 points		Redcliffe Radio Club.
VK6ANC	11582	"	Northern Corridor Radio Group.
VK3ANR	7726	"	Geelong Radio & Electronics Society
VK1WI	5930	"	WIA Act Div
VK5SR	5864	"	Southeast Radio Group.
VK5AH	5237	"	
VK4WIE	4723	"	City of Brisbane ARC.
VK3BCG	4143	"	Camberwell Grammer School RC.
VK2CAM	3911	"	
VK4WIT	3079	"	The Townsville ARC.
VK4WIC	2758	"	Dalby & District ARC.

Section "E" Portable TX Open, M op.

VK3CNE	14672 points		
VK2WG	8058	"	Wagga Wagga ARC.
VK3SCD/p	6446	"	Cheltenham Radio & Elec. in Scouting Club.
VK2FFG	5072	"	Fishers Ghost ARC.
VK5ARC	4882	"	South Coast ARC.
VK8AR/p	4621	"	Alice Springs ARC. disqualified ≠
VK3ER	1761	"	Eastern & Mountain Districts RC.
VK4HM	1458	"	Cairns ARC.

Section "F" Portable TX VHF, S op.

VK2XEX	1186 points		
VK2XGX	996	"	

Section "I" Home TX Mains Pwr.

VK3ZI	555 points		
VK3XB	425	"	CW.
VK4PJ	132	"	
VK3KS	94	"	CW.

Check log from VK4IY. Tks Ross.

VK8AR/P. Not complying with section 19 of the contest rules as printed on page 16 of the February issue of "AR". Not providing the operators signatures on the front sheet of the original entry, nor upon a second front sheet after the omission of the operators signatures, and list of equipment used as pointed out to the ASRC In accordance with rule 22 of the contest the FCM has disqualified the entry from the Alice Springs amateur radio club.

DIVISION "B" 6 HOURS

Section "A" Port, TX Ph, S op.

VK5QX	1759 points	
VK5DI/p	1282	"
VK5GN/p	1274	"
VK4AIZ	1202	"
VK5KXX	991	"
VK3MI	710	"
VK4IY	487	"

Section "C" Portable TX Open, S op.

VK5ABS	2027 points	
VK2EL	598	"

Section "D" Portable TX Ph, M op.

VK4YX	2614 points.		3 ops.
VK3SOL	1220	"	Shepparton ARC 3 ops.
VK5BRC	1078	"	Barossa Valley RC Inc. 8 ops.

Section "E" Portable TX Open, M op.

VK4WIN	2715 points		Brisbane North RC. 5 ops
VK5BAR	2200	"	Adelaide Hills ARC 7 ops

Section "F" Portable TX VHF, S op.

VK4WIZ/2	6988 points		Radio amateurs group. 203 Ph, 77CW
VK3XRS	750	"	
VK4ZXZ	445	"	
VK4VR	370	"	
VK4ANN	340	"	YL.
VK3BBB	195	"	

Section "H" Home TX emergy pwr.

VK3CBT	1278 points		
VK5AGX	712	"	

VK2EVD	477	"
VK6AXB	255	"
VK2JM	12	"

Section "I" Home TX main pwr.

VK2ENU	529	points
VK1RH	330	"
VK2KPF	254	"
VK1BEB	157	"

The Presidents Cup Trophy (copy of) has been won by VK4YPB operating VK4WIZ/p with a CW score of 3080 points. Congratulations on a good VHF CW Score

Rules of the 1989 VK-ZL-Oceania DX Contest

SSB October 7-8 1989
CW October 14-15 1989
FOR OVERSEAS ENTRANTS.

1 SSB Within a 24 hour period, from 0100 UTC Saturday 7 October, to 1000 UTC Sunday 8 October 1989. Operate for a MAXIMUM of 12 hours. Take your operating periods in one hour blocks, based on "even hour to even hour" in UTC, eg 1000 to 1100 UTC or 1300 to 1500 UTC etc, with MINIMUM periods of one hour

1a CW Within a 24 hour period, from 1000 UTC Saturday 14 October to 1000 UTC Sunday 15 October. Operate for a MAXIMUM of 12 hours. Take your operating periods in one hour blocks, based on "even hour to even hour' in UTC, eg 1000 to 1100 UTC or 1300 to 1500 UTC etc, with MINIMUM periods of one hour.

RECEIVING

SSB and CW combined in the above times. (Maximum total of 24 hours).

2 Only one contact per mode per band is permitted. All bands may be used except WARC bands.

3 Scoring
For stations operating outside Oceania, score TWO points for each contact with VK, ZL, or Oceania Stations Oceania stations score TWO points for all contacts.
NB: Oceania stations are those which qualify as Oceania for WAC.

4 Final Score.
Multiply the total QSO points by the sum of all VK/ZL/O prefixes worked on ALL bands. (The same VK/ZL/O prefix worked on a different band counts as a different unit).

5 Cyphers.
Exchange a five or six figure digit composed of RS(T) report, plus a three digit sequence number beginning at 001, and increasing by one for each QSO on that band.

6 Logs.
(a) Separate logs for each band please, and for SSB and CW
(b) Show date, time UTC, Call of station contacted, cyphers sent and received.
(c) Indicate clearly each new VK/ZL/O prefix worked. (Underline, highlight or show in a separate column, as in CQ WPX)
(d) State QSO points claimed for each band.
(e) State VK/ZL/O prefixes claimed for each band.
(f) Summary sheet to show:
Call sign, name and address.
Total QSO points claimed on all bands.
Total VK/ZL/O prefixes contacted on all bands.
Total points claimed.
Declaration that the rules were observed

POST LOGS TO WIA VK/ZL Oceania Contest Manager VK7BC, Frank Beech, 37 Nobelius Drive, Legana, Tasmania 7277, Australia, to arrive by 15 February 1990.

7 SWLs
A VK, ZL or Oceania station must be heard in a contest QSO-Logs to be set out as for transmitting section.

8 Awards
Separate awards for SSB and CW
(a) Special coloured certificate to the top scorer in each continental area
(b) Special coloured certificate to the top scorer in each country.
(c) Participation certificates to all others on request (two IRC for postage please)
Copy or relevant results available on request (one IRC please)

FOR VK AND ZL STATIONS.
Check with overseas rules.
Rules 1, 2, 5, 6 as for Overseas stations EXCEPT in rule 6 (deadline)

3 Scoring
Different points for contacts on different bands are as follows.

160m	20 points
80m	10 points
40m	5 points
20m	1 point
15m	2 points
10m	2 points

Total Score will be the total QSO points multiplied by the total number of prefixes worked. The same prefix worked on a different band is counted Note: K1, W1, AA1, N1 etc are all different prefixes. W1AAA/6 would count as W6, NOT W1.
VK and ZL stations are permitted to contact each other ONLY on 160 and 80m VK/VK ZL/ZL, and ZL/VK contacts are permitted on these two bands

6 Change - Logs to arrive by December 11th 1989

7 SWL Section
As for overseas BUT.
VKs must hear and log ZL or other stations (No VK stations)
ZLs must hear and log VK or other stations (No ZL stations)

8 Awards
Separate awards for SSB and CW.
(a) Special certificates to top scorers in each prefix area.
(b) Special certificates to top scorers on each band
(c) Participation certificates to all entrants on request (Two IRC for postage please)

The WIA/ZL/Oceania Contest Manager, VK7BC Frank Beech, 37 Nobelius Drive, Legana, Tasmania 727 ar

EXTENSIVE RANGE OF ELECTRONIC COMPONENTS FOR THE RADIO AMATEUR & HOBBYIST
DISPOSAL BARGAINS
* STEPPER MOTORS * DISPLAY TERMINAL/KEYBOARDS * SWITCHED MODE POWER SUPPLIES
* MUFFIN FANS * POWER TRANSFORMERS * COMPUTER GRADE ELECTROLYTICS * CIRCUIT BOARDS
IAN J TRUSCOTTS
ELECTRONIC WORLD
FOR ALL YOUR COMPONENT REQUIREMENTS
MAIL ORDERS WELCOME
Phone: (03) 723 3860
(03) 723 3094
30 LACEY STREET
CROYDON 3136

AWARDS

New Award from Fisher's Ghost ARC

Ken Gott VK3AJU
Federal Awards Manager
38A Lansdown Road
St. Kilda 3183

The Fisher's Ghost Award is alive and well and its sponsor - the Fisher's Ghost ARC, located in Camden, NSW - is now offering another certificate, the Macarthur Award, named for the founder of the merino wool industry

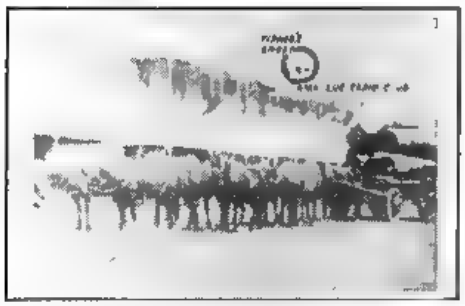
The certificate (see below) shows a sepia tone scene of a bullock team and wagon in Camden's main street, around 1910, with award details overprinted in black.

The new award is based on contacts with stations in 98 localities in and around the historic Macarthur district, each counting one point, plus a contact with the VK2FFG, the club station, worth two points.

The basic award is obtained by contacts with FGARC members in five locations, with upgrade stickers for scores of 25, 50, 75, and 100 points.

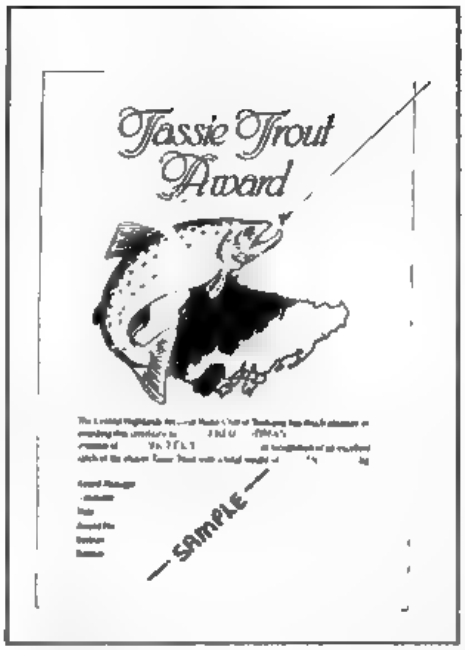
Log extracts are not necessary, but the Macarthur Award checksheet must be used when applying for the basic award or any later upgrades The checksheet, listing the 98 eligible localities, can be obtained by sending a 9 x 4 cm SSAE to Awards Manager, PO Box 249, Camden, NSW 2570 The award is won by listing QSO data on the checksheet and returning it with $5 to the Awards Manager. After checking, the checksheet is returned to the sender for further use in applying for upgrades.

The Macarthur Award commenced on 7/7/89 and those interested can pick up points on its net on 3.580 MHz at 1000 UTC each Friday night. Net control will give details of mobile excursions which will enable various locations on the list to be worked.



Tassie Trout Award

The Tassie Trout Award (shown below) has been established by the Central Highlands Amateur Radio Club of Tasmania. Applicants must "catch" 14 kg of trout from May 25 1989, the "weight" being earned as follows: Club station VK7CHT 3 kg, President VK7KZ 2 kg, Treasurer VK7NDO 2 kg, Vice-President VK7NBF 2 kg, and all other members 1 kg. However, if a member is located portable in the Central Highlands, the QSO is worth 2 kg Members are VK7s AY, DY, GT, JH, HX, KB, KBA, KBG, KV, NIM, NRR, NWR, NXA, RM, VV,



XA, YW, YAF, ZMF, and VK3CWJ, VK4PCL and VK5NEH.

QSOs may be on any band, using any mode, but repeater contacts are not eligible Only a log extract is needed (ie it need not be certified by other amateurs), plus $4 by cheque, money order or stamps (no IRCs please)

Send to: Awards Manager, Central Highlands ARC, c/- 28 Hamilton St, West Hobart 7000.

My listening suggests that tuning to the Tasmanian Devil Net run by Bob VK7NBF each Tuesday at 1000UTC on 3.590 MHz could be fruitful in snaring QSOs for the Trout Award, as well as the better-known Devil Certificate.

Survey of VK Awards

The results of my recent survey of awards believed to be on issue by various VK divisions, clubs, zones and other groups, were due to be published in this issue of AR.

Unfortunately, the fickle finger of fate intervened, causing me to spend the latter half of July in hospital

I expect to have things back on track fairly soon and to publish the conclusions of the survey in next month's AR.

In the meantime, my thanks to the dozens of award managers who returned the questionnaires to me.

Bargain IRCs

The hundreds of IRCs which I offered to WIA members at 80 cents each were cleared fairly rapidly. Demand exceeded supply and I have had to return cheques and other remittances to some members whose orders arrived too late Sorry chaps

ARRL DXCC Honor Roll

I'm grateful to Austin VK5WC for monitoring QST monthly and sending me the latest VK listings on the ARRL DXCC Honor Roll The listings are valid as of 31/3/89 and appeared in the July issue of QST

Phone

318: VK6RU/365, VK5MS/362
315: VK4QM/349, VK6HD/333, VK6LK/331
311: VK5WO/337

[illegible]

316: VK4QM/364, VK6HD/335
315: VK3YL/351
314: VK5WO/343

I understand that the phone listing for VK5WO will be corrected to 314/340 in the September issue of QST (I suppose it is comforting to learn that even QST suffers from printers errors, since the DXCC Updates in the August issue of AR were messed up. The list, as it was intended to appear, is set out below). The total ARRL country list stood at 320 on 31/3/89. No VKs were listed on the ARRL CW Honor Roll.

DXCC Updates.

	CW	Phone	Open
VK1ZL		284	
VK3OT		305/309	308/312
VK3YJ		305/306	
VK3AJU		150	
VK4DA	154		155
VL4KRP		153	
VK4FQW		136	
VK6LK		316/332	
VK6NE		309/319	
VK2EG(RTTY)		150	

ar

HMCS Protector Award

Errata from July issue P52 should have read as follows All bands and modes are acceptable, with appropriate endorsements available. Cost is A$4 or five IRCs. RNARS members commonly use these frequencies -

On Mondays:3 615 MHz, 1000-1130Z, and 3 620 MHz, 1100-1200Z.

On Tuesdays:3 521 MHz, 0930 1030Z and 3 527 MHz, 1030-1130Z

On Wednesdays 21 133 MHz 0930-1020Z.

Daily on 14 052 MHz, 0500-0900Z

Other frequencies used by members are: 7090 kHz, 14 335, 21 360 and 28 410MHz (SSB), and 3 520, 3 527, 7 020, 14.052 and 28.052 MHz (CW)

South Australian group members active include VK5s AF, HH, RA, RM, VG, WE, YC, YT, AFB, AFP, CGB and NDX.

QD ELECTRONICS

RADIO REPAIRS AND SERVICE

tel. JOHN MELIA VK3QD
radio technician engineering

(03) 751 1231

Lot 7 Ridge Rd,
cnr Yvonne Rd
Mount Dandenong VIC
3767

licenced second-hand dealer

A Call to all Holders of a Novice Licence

Now you have joined the ranks of amateur radio, why not extend your activities?

The Wireless Institute of Australia (N.S.W. Division) conducts a Bridging Correspondence Course for the AOCP and LAOCP Examinations

Throughout the Course, your papers are checked and commented upon to lead you to a successful conclusion

For further details write to:

The Course Supervisor
W I A.
PO Box 1066
Parramatta, NSW 2124
(109 Wigram Street, Parramatta)
Phone (02) 689 2417

11 am to 2 pm **M to F**
7 to 9 pm **Wed**

Review Article: CM Howes Communications CVF80 VFO

Gil Griffith VK3CQ

(Courtesy Dick Smith Electronics)

Gidday Morsiacs, I hope to begin my return to spending some more time on Amateur Radio with this review of the VFO which matches the CTX80 transmitter that I reviewed in December 1988 Pounding Brass. Following this will be the DcRx80 receiver, which should be up and running in short order.

The CVF80 features a stable FET oscillator, dual buffered outputs, onboard voltage regulation, 11-15 V DC operation, and gives transceive operation with the DcRx and CTX80. It also has an IRT control, which is, receive incremental tuning or RIT

The kit comes with all the components, circuit board and wound inductor, but not the tuning capacitor The instructions are 6 pages, which are not only easy to follow, but include a list of resistors and capacitors, with columns to mark when you have fitted and tested each component. It even gives the colour code for every resistor! Unnecessary for Amateurs but great for raw beginners, who can learn a lot before going for their ticket, just by building a few kits of this type

Assembly is dead simple, as *everything* is marked on the component side of the board, with outlines of the transistors (there are 9!), and diode polarity markings etc. It took me about 2 hours, but I like to check each resistor with the meter before installing, just to make sure. I also like to bend component leads over before soldering as this makes for less dry joints 10 years down the track

I was pondering overnight whether to put the VFO straight into an aluminium box, but decided to run a few tests with the board laid out on the bench first. I hope to incorporate all the kits in one box at a later date, but the transmitter is already mounted in its own box, and I don't know which other kits I will be using in the final transceiver. Hopefully it will include the transmitter, receiver, VFO, electronic keyer, audio filter, and maybe a tuner if it will fit!

Back to the bench, where I connected a lead to the tuning capacitor, a tiny (30 by 35 by 50) three turn dual ganged unit I picked up at a field day, using the smaller gang, which looks about 300pF. A lead to my frequency meter and another to the 12 volt supply, and everything is ready for some testing. A funny thing occurred to me shortly after switching on, and that was that I fully expected the VFO to work first time, and neglected to watch for smoke escaping from the little black things where it is stored.

There are two places provided for connecting the tuning capacitor, with different amounts of spread on each. Also screwing the slug of the inductor in or out gives a lot of frequency control. It will depend on what you decide to use for a tuning capacitor, but with mine I got the following results

	Wideband	Narrow Band
Slug in	1.720 - 2 780	3.540 - 4.030
Slug out	2.475 - 3 965	3.835 - 4.225

As I am looking for about 3.5-3.6 MHz, I fitted a 150pF poly capacitor in series with the tuning capacitor, connecting it to the narrow band input to give a final result of 3 500 to 3 580 MHz. The IRT (RIT) gives about 4 kHz spread in its wide mode, and about 1 kHz in its narrow mode, simply a matter of where you install the wire link. It is a pleasure to know that you can get any sort of bandspread you like, even right down to the 160 metre band, a nice bonus It shouldn't be too difficult to arrange a switch to give both bands

What else can I say? I'm not at all surprised that the unit worked first time, and provided you work systematically and with a little care, you should have no problems at all with this kit. I am looking forward to building the receiver and getting everything on air within a short time.

You can get yours at Dick Smith Electronics.

■■

Radio ZS Dec 1988

DATA & DIGITAL COMMUNICATIONS

AMTOR and PACKET

Brian Beamish VK4AHD
Asia Net Co-Ordinator
Sys Op VK4BBS PBBS
35 Chester Road
Eight Mile Plains 4113

Well, here we are again after missing a couple of months from AR. This month I have two articles. One is from Peter Martinez G3PLX. Peter is recognised as one of the world leaders not only in Amateur Radio but also Commercial in the field of Amtor/Sitor and was the first person to introduce Amtor to our hobby.

The second article is from John Bews VK4KJB, president of the Queensland Digital Group, and I am sure will answer some of the fears of those considering packet radio.

ANARTS have also promised me a suitable article. With a little luck I hope to have it for you in the very near future.

The GB7PLX AMTOR Gateway Mailbox

Peter Martinez
G3PLX

On 11th May 1989, GB7PLX was licensed, and became operational as an AMTOR mailbox, and gateway to the UK packet network, the culmination of a great deal of experimental work, discussion, and negotiation. This short article describes the set-up at GB7PLX, how it works, and how it can be used by both packet and AMTOR operators.

The equipment at GB7PLX, which is operated by the author from his home station, consists of an HF transceiver, (Kenwood TS930S) and associated antennas, covering 3.5, 7, 10, 14, 21 and 28 MHz, connected to an AMTOR terminal (ICS Electronics AMT-2), and from there to a computer (home-brew). The computer can also control the radio to select any of 16 channels on any of the HF bands and switch the antennas. Also connected to the computer is a packet TNC, to which is connected a 2m transceiver and antenna. In the standby condition, the HF radio is scanning all bands, with the AMT-2 set to detect the GPLX selcal code, and the TNC is open for packet connects, with the radio on the local mailbox net.

If a call is detected on HF, the AMT-2 responds, the scan stops, and the calling station can then, after identifying himself, enter messages into the mailbox for collection by another station, or for forwarding onwards, either on AMTOR or on packet. The calling station can also extract messages for himself, or read various other files, in a way which will be familiar to most packet operators. The calling station could be another AMTOR mailbox. Periodically, the mailbox may break off from scanning, and call one of several other AMTOR mailboxes worldwide, on the appropriate channel, and forward any outstanding messages.

On the packet side, the mailbox may receive connects from one of the local UK packet mailboxes (but not from individual packet stations), with messages for forwarding to international destinations. The GB8PLX mailbox may periodically connect to one of the local packet mailboxes, and pass messages to them for forwarding around the UK.

Let's suppose that you are any AMTOR operator wishing to use the mailbox. How do you go about it? Firstly, decide on the best band to use, and listen on one or more of the channels which appear in Appendix 1. Remember that you will probable need to offset your radio dial one way or the other by an amount which will depend on the configuration of your radio and AMTOR terminal. Check that the channel is not in use, and remember that the GB7PLX mailbox (or any other for that matter) has no priority over any other activity on any channel, so if all the channels are occupied, you will just have to wait patiently! Having chosen the channel, start an ARQ call to GPLX. If GB7PLX is not busy, and there is a path, then the scanner will find you within 10 secs. There is therefore little point in calling for much longer than this. Best to make frequent short calls, rather than sitting on the channel. When the link is established, type:

"GB7PLX DE (your callsign) +?"

The mailbox will reply with:

"(your callsign) DE GB7PLX MAILBOX"

If it comes back with QRZ or a garbled version of your callsign, then start again. After the response, the mailbox will then tell you if there is any traffic for you, and you can then enter one of several commands, the first of which is HELP, which tells you about all the others. The most used commands are QTC, which reads out any messages for you, in the same way as the RN command familiar to packet mailbox users, and the SP command, which is used in a similar way to that of packet mailboxes, except that, since AMTOR cannot transmit the "@" symbol used in the packet version of the SP command, the word "AT" is used instead.

The method by which the mailbox routes messages to their correct destinations, may need some explanation, as it used the new "Hierarchical addressing" format, which is fairly new to the packet world. In this format, the "address", namely that part of the SP commandline after the "AT", may consist of several parts, or "tokens" separated by dots. The first of these will normally be the destination mailbox callsign, and the second and subsequent tokens will be the names of regions, countries, continents, and so on, to help with the routing. In any mailbox, a list of known mailbox callsigns, region names, country names, and continent names, is kept, together with the best routing for each one. When a message is received, the mailbox looks to see if it recognises the first token in its list. If so, it passes the message along the corresponding route. If it doesn't recognise the first token, then it looks at the second, and so on. In this way a mailbox can route messages to destinations in other regions, countries (or networks), without having to know routes for each destination individually. In the GB7PLX mailbox, the address list currently contains (a) a selection of worldwide AMTOR mailboxes, (b) three-letter country codes representing those countries to which it is possible to forward messages for the national packet network. The list is quite small at the moment, but will grow rapidly as more AMTOR mailboxes become operational.

Here are some examples of SP commands which are possible at the moment:

SP G9ZZZ+? — This is simply a message for G9ZZZ to collect next time he calls into GB7PLX.

SP HB9XX AT HB9AK — This is a message to be forwarded to the HB9AK mailbox for HB9XX.

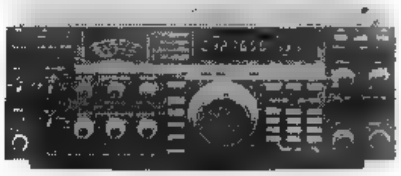
SP WØRLI AT WØRLI USA — This one will get forwarded to USA on AMTOR, then via packet to the WØRLI mailbox.

In order to guarantee that the message can never go astray, even if there is the odd garbled character in the commandline, a technique slightly different to that used to enter SP commands to packet mailboxes, has been devised for use at GB7PLX. First enter the SP command-line, ending with the usual +? If the command has been received correctly and can be forwarded, the mailbox will read it back. Is it was garbled, either in transmission or read-back, then enter it again. If the read-back is good, then enter the commandword TEXT, followed by a short title line, followed by the message itself, ending with +? The mailbox will respond with TEXT STORED OK. If the mailbox got your TEXT transmission garbled and responded with an error message, or you receive the response garbled so that you are not sure if the mailbox got it, then you can again repeat the TEXT transmission. If the mailbox did, in fact, get it first time, then it will respond TEXT IGNORED the second time. Either way, if you receive a response starting with TEXT, you can be sure it got it OK.

This procedure has been carefully devised to be completely foolproof, and, like the callsign exchange in the sign-on procedure, can be very easily implemented automatically, for example, in another AMTOR mailbox forwarding mes-

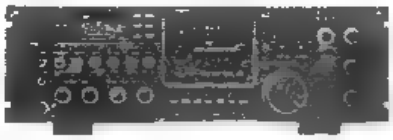
3 STORE BUYING POWER

ICOM **IC-765**



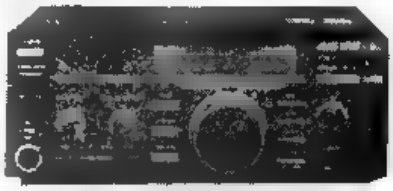
HF SUPERIOR GRADE TRANSCEIVER
FANTASTIC TRANSCEIVER
Price $4199

ICOM **IC-781**



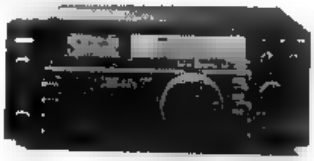
HF ALL BAND TRANSCEIVER
THE ULTIMATE!
PRICE $8199

ICOM **IC-726**
incl 6 mtrs



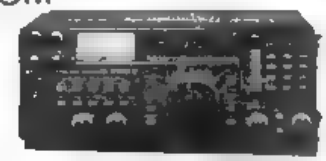
100kHz to 30MHz General Cov RX ALL MODES
100 WATTS HF 10 WATTS 6 Metres
Price $1699

ICOM **IC-735**



Latest in ICOM's Long Line of HF Transceivers
TERRIFIC MOBILE HF ECONOMY RIG
Price $1579

ICOM **IC-7000**



25MHz 1300MHz
THE PROFESSIONAL SCANNER
A must for monitoring your
VHF/UHF Transmissions
Price $1645

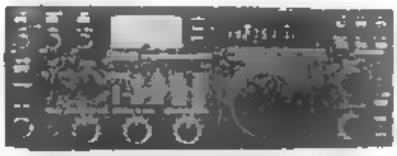
ICOM **IC-32AT**

440 MHz, 2MTR
DUAL BAND
Price $735
- Full Duplex
- 5 5 VHF 5 WUHF
- 20 memories
- Power saver function

ICOM **IC-71A**

COMMUNICATIONS RECEIVER
• 100 kHz 30MHz • 32 memories
Price $1450

ICOM **IC-751A**



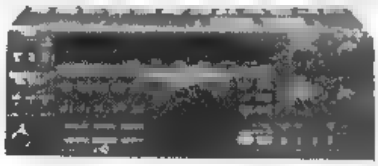
HF ALL BRAND TRANSCEIVER
SUPERB VALUE
Price $2050

ICOM **R9000** COMMUNICATIONS RECEIVER

- 100kHz - 2GHz Continuous Channels
- 1000 memory
- Multi Scan Functions
- Direct Keyboard Entry

NEW **Price $6350**

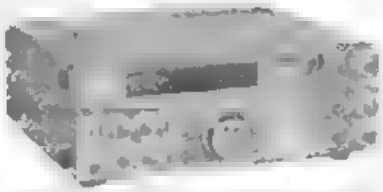
KENWOOD **TS-440S**
HF TRANSCEIVER



- 160m to 10m Amateur Band
- 100kHz to 30 MHz General
- Available with built in Antenna Tuner

Price $2399

KENWOOD **TS-940S**



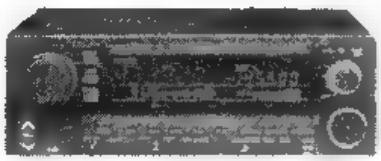
TOP-OF-THE-LINE - HF TRANSCEIVER
THE VERY BEST
Price $4250

KENWOOD

TH-25AT/45AT
2m 70cm

First pocket Hand held Transceivers
with Automatic Power Control
GREAT PRICE
GREAT PRODUCT
Price $560

KENWOOD **TM-721A**
2mtr/70cm



Full Featured
Dual Bander

LOW PRICE $1040

KENWOOD **TS-680S**
160m to 6m

100kHz to 30MHz General
Cov RZ ALL MODES
100 WATTS HF 10 WATTS 6 Metres

Price $1820

HOW TO GET COMPONENT SALE

ELECTROLYTIC CAPACITORS.

MALLORY 1000 MFD 450V DC	$20
MALLORY 650 MFD, 450V DC	$15
BOSCH 10 MF 5000V DC	$90
280 PF 2000V CERAMIC	$50

variable capacitors with extended shaft for that unique ARRL TRANSMATCH YOU ALWAYS WANTED TO BUILD
AVAILABLE SYDNEY STORE ONLY
LIMITED STOCK
92-94 Wentworth Ave , Sydney NSW, 2000
Telephone 211 0988

Brisbane. 394 2555 Melbourne 670 0330

EMTRONICS

sages. The only difference in a forwarded SP message from another mailbox, is the addition, after the "AT (address)" information, of "FROM (originator)", being equivalent to the "<" field in forwarded packet messages. To sign-off, just close down the ARQ link in the usual way.

From the point of view of the packet user, he does not need to know any of the above procedures. He will just enter messages in the normal way to his home mailbox, but a wider choice of destinations will be made available to him by the packet network. In the UK, the packet network recognises the address "AMTOR" as meaning "the nearest AMTOR gateway", which, for the moment, means "GB7PLX", but could, if other gateways become operational, be interpreted differently in different parts of the country. Thus, for example, a packet operator in the UK can enter into his home mailbox

SP VK4AHD @ VK4BBS.AUS.AMTOR

This will be routed to the nearest AMTOR gateway, from there to Australia on AMTOR, and from there to VK4BBS by whatever medium is appropriate.

It is worth mentioning that, unlike packet, which can transmit the full ASCII character set, AMTOR is restricted to upper-case letters, figures 0-9, and a relatively small set of punctuation marks. At GB7PLX, incoming packet messages are converted from lower-case to upper-case, and any punctuation marks which cannot be transmitted, are simply ignored. Incoming AMTOR messages are passed to packet as received, that is, in upper case only. Also, since AMTOR is rather slower than packet, messages should be kept short. GB7PLX will not handle bulletins.

This, then, has been a brief description of the GB7PLX mailbox. It is hoped that this will be the start of the development of a worldwide network of AMTOR mailboxes, each with gateways into national packet networks. Much work needs to be done to optimise and standardise the procedures in use, and we need many more compatible AMTOR gateways worldwide.

Appendix 1

GB7PLX HF frequencies

3.5 MHz	3587.5	3588.0	3588.5	3589.0
7 MHz	7035.0	7036.0		
10 MHz	10140	10146		
14 MHz	14075	14076	14077	14078
21 MHz	21080	21081		
28 MHz	28075			

Note that, initially, the GB7PLX licence only applies to 7, 10, and 14 MHz, but the mailbox will respond to the same GPLX selcal on the other bands, signing G3PLX, but only when the station is attended.

Appendix 2

Forwarding list

(a) AMTOR mailboxes
- GB7PLX
- SM6GXQ
- SK7CS
- KS5V Texas
- WA8DRZ California
- KB1PJ Ohio
- VK2AGE Sydney
- HB9AK
- PA0RYS
- LA9OK

(b) Country Codes
- AUS Australia
- GBR United Kingdom
- IRL Republic of Ireland
- SWE Sweden
- NOR Norway
- [illegible] United States

J P Martinez G3PLX
13 May 1989

Why I'm Not Scared of Packet Radio

John Bews VK4KJB - President Qld Digital Group

What is packet? This is a question asked by many people interested in Packet Radio. The answer that they get may be enough to scare them away from a very interesting facet of Amateur Radio for a long time. This article attempts to explain how the basic concepts used in Packet Radio evolved.

It is my belief that if basic concepts are understood then the so-called technical concepts follow much more easily.Basic concepts always start with a bit of history. This then is my attempt at explaining why Packet Radio came into being.

Morse code is the original form of digital communications. It consists of a series of short and long signals (call dots and dashes)that represent the letters of the alphabet. There are short spaces between the dots and dashes in a character, longer spaces between words. The basis for this code is that commonly used characters are short and less frequently used characters are longer. This is convenient when sending morse code by hand and receiving morse code by ear. If we want to send the message more quickly, we could use a machine. The variable size of the characters, an advantage for hand sending, is not so convenient now. The mechanical machines have difficulty handling the different lengths of the characters.

The need to send messages more quickly was important, so a method of getting around the problems with the variable length characters of morse code was found. This solution was a fixed length code called the Baudot code. This code uses a fixed length combination of five bits for all characters and punctuation in the alphabet. It has no spaces between characters, instead a start bit and a stop bit mark the beginning and end of the character. This is called asynchronous data. With this code, machines could send much faster and more reliably than could be done by hand. The Baudot code is the code used by amateurs for RTTY. Unfortunately with Baudot, if an error occurred in a character there was no method of knowing, or correcting it.

The need to add error checking facilities to the code, as well as the need for more characters in the code, led to the development of the ASCII code. This code uses seven bits of information and a parity bit to give an eight bit character. The parity bit is used to find out if a single bit in the seven bit of information is in error. The code still uses a start and a stop bit to mark the beginning and end of the character. The ASCII code is used by most computers nowadays. Although the ASCII code can detect an error, it cannot correct it.

The need to add error checking and correcting facilities to the ASCII code led to the development of protocols such as Christensen Protocol and Kermit. These protocols are used in computer modem programs such as XMODEM, YAM, PROCOMM and KERMIT. These protocols package a block of data up into a packet. They add some header characters to the front of the packet and a Frame Check Sequence (FCS) to the end of the packet. The header characters mark the start of the packet, its sequence number and how long it is. While the data is being sent a checksum is calculated by adding up all the data bytes. The result of this sum is placed in the Frame Check Sequence at the end of the packet and sent.

The receiving computer detects the start of the packet and notes the sequence number and length of the packet. As the data is received, it calculates the checksum by adding up all the bytes. It then compares the calculated checksum with the checksum sent to it in the FCS. If they agree then the receiving computer acknowledges the correct receipt of that packet by returning a short acknowledge packet to the sending computer. If the checksums disagree then a negative acknowledge packet is sent and the sending computer re-sends the packet.

With this sequence, there is no need for the parity bit in the ASCII code. It is checked for errors at the packet level. So if the parity bit is used along with the seven information bits then a byte of data (eight bits in all) can be sent. This means that protocols such as Christensen Protocol can be used to transfer programs as well as ASCII.

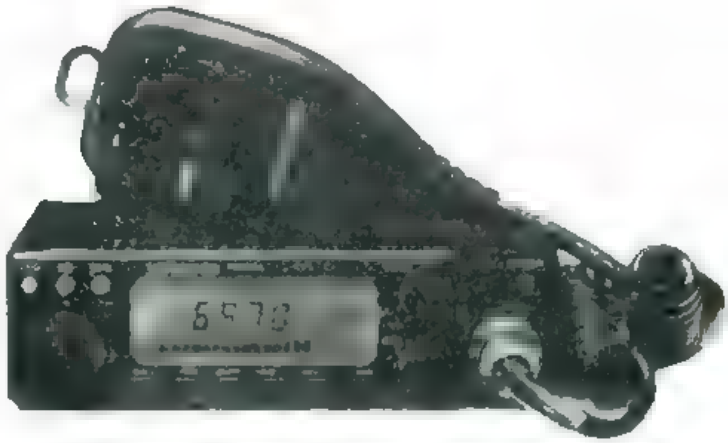
It should be noted that every character in the packet is sent with a start and stop bit, marking the beginning and end of every character. This means, that for every character we are sending ten bits of information, when only eight bits are being used. This is quite wasteful. The solution is not to send start and stop bits. All timing is done using a clock. This is called synchronous data because the data is in synchronism with the clock.

It should also be noted that if the packet is sent out via radio, then every station listening can receive the packet. If a number of stations received the packet with errors, then they would all try to send a negative acknowledge at the same time. Obviously this would not work. The solution is to send the packet to a single station at a time. This means that the packet header must contain an address identifying the destination station.

These concepts of fast, efficient and reliable data communications are the basis for the AX.25 protocol used in Packet Radio. The packet uses a header consisting of FLAGS, ADDRESS, CONTROL and PROTOCOL ID information. The FLAGS mark the start of the packet. The ADDRESS contains the callsigns of the destina

KENWOOD

NEW!



TS-790A

ALL-MODE TRIBAND TRANSCEIVER

Work all the upper bands and gain access to the latest communications techniques with the all-new Kenwood TS-790A. This transceiver gives you access to the exotic world of VHF and UHF communications including Satellite Moonbounce, Grid-square DX and VUCC. All with legendary Kenwood ease and reliability.

Features include: All-mode Triband coverage: 144-148MHz 430-450MHz 1240-1300MHz USB LSB CW CW(N) and FM • 45 watts output (VHF) • Very high performance GaAs FET RF amplifier for high sensitivity and wide dynamic range • Dual watch function across bands • Band selection exchange function • Satellite communication frequency correction for uplink/downlink operation • Auto-mode and auto repeater offset • 59 multi-function memories • Call channel function • Repeater Reverse • Memory scroll and shift • Multi-scan functions and much more!

TM-231A

2M FM MOBILE TRANSCEIVER

This compact mobile transceiver delivers 50 watts of power with the controls at your fingertips.

Features include: • Multi-function microphone with Call, VFO, Memory Recall and a Programmable key • Large amber display plus illuminated keys • 50/10/5 watts switchable power output • Sensitivity 12dB SINAD/less than 0.16uV • 20 multi-function memories • Programmable call channel • Selectable CTCSS encoder built in • Tone Alert system • Multi-mode scanning (band, programmable band memory plus programmable band) • Options include remote control and digital recording.

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066
Ph: (02) 428 1455 Fax: (02) 427 6869
Call now for further information and the name of your nearest authorised Kenwood dealer.

Please phone or mail/fax for information

Name

Address

Postcode

Publication Issue

tion station, the source station and any digipeaters (intermediate stations) used in the link. The CONTROL contains information about the type of packet (acknowledge or negative acknowledge, etc.) The PROTOCOL ID or PID defines the type of protocol in use (AX.25 or others) The data is sent next. This can be up to 256 bytes of information. The simple checksum is not used in AX.25 to calculate the Frame Check Sequence. Instead, a better error checking method called the Cyclic Redundancy Check (CRC) is used. The packet is closed by sending more FLAGS

This then is how Packet Radio, a very interesting aspect of the Amateur Radio hobby, evolved. Most of the concepts evolved as a result in the short-comings of the previous generation of communication systems It should be noted that there are short-comings in the current AX.25 protocol, particularly in the area of digipeating, so we can expect new systems to come along that will get around the problems. We should not be scared of these new systems but should evaluate them carefully and embrace them if they show promise.

This understanding of where packet has come from, where it is at, and possibly where it is going is why I'M NOT SCARED OF PACKET RADIO.

ar

Continued from page 5

DX EDITOR

It is with regret that we have accepted the resignation of Pat Kelly, VK2RZ, as DX Editor for Amateur Radio. Readers will know that for quite some time we did not have a regular DX Editor for our magazine and then, commencing with the April 1989 issue, Pat took over and has produced a very interesting and informative column since then.

Unfortunately, Pat recently suffered a further health set back and has had to reluctantly relinquish his task. On behalf of all our readers, Pat, thank you for your excellent contribution over the past six issues. We all wish you the very best for the future.

Amateur Radio is in the market again for a DX Editor Any offers?

FEDERAL AWARDS MANAGER

Ken Gott, VK3AJU, the energetic and bustling Federal Awards Manager gave everyone, including himself, quite a scare recently when he suffered a heart attack.

Ken spent quite some time in intensive care in hospital, then came home for a couple of weeks, but has now returned to hospital We wish him a speedy recovery

To page 53

TELL THE ADVERTISER

YOU SAW IT

IN AMATEUR RADIO

AMSAT

Eclipses, Microsats

Maurie Hooper VK5EA
11 Richland Road
Newton SA 5074

National Coordinator
Graham Ratcliff VK5AGR
Information Nets
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC Sunday
Primary frequency: 3.685 MHz
Secondary frequency: 7.064 MHz
AMSAT SW Pacific
2200 UTC Saturday, 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divi[illegible].

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has about 300 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows

AMSAT Australia, GPO Box 2141, Adelaide 5001.

The Newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites.

Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services send a SAE to Graham

AO-13 Solar Eclipses by the Moon

James Miller, G3RUH

Date	UTC HHMM	DUR min	Orbit MA/256 No.	Start	End	Max % Obsc
1988 Jul 14 (Thu)	0256	40	82	161	174	61
1988 Aug 13 (Sat)	0040	56	125	82	103	78
1988 Sep 11 (Sun)	1156	39	187	35	48	65
1989 Feb 06 (Mon)	0838	14	497	8	12	64
1989 Mar 07 (Tue)	1109	36	559	61	72	79
1989 Jun 03 (Sat)	2211	35	749	186	200	67
1989 Aug 31 (Thu)	0709	33	929	13	25	9
1990 Jan 26 (Fri)	1500	28	1249	25	34	85
1990 Feb 25 (Sun)	0836	25	1302	70	80	8
1990 Mar 26 (Mon)	2215	33	1364	115	126	11

The table shows all past and some future eclipses of AO-13 by the moon. If anyone has records of these events, please send data to one of the command stations (ie G3RUH, VK5AGR, ZL1AOX or DB2OS)

The series "The First Flock of Microsats" concludes this issue

Uplink Performance

It is assumed that user uplink equipment for LUSAT and PACSAT will be comparable to the equipment used for the downlink with the exception that FSK modulation is employed rather than BPSK. For a bit error rate of one part in 100,000 an uplink Eb/No of 13.8 dB is required. Modest uplink power (10 watts) and simple circularly polarized antenna are assumed.

Uplink performance is as follows:

User TX Power Output (10.0 Watts):	+10.0 dBW
User Station Losses:	-1.0 dB
User Station Antenna Gain:	+2.0 dBIC
User Station EIRP:	+11.0 dBW
Uplink Path Loss (146 MHz at 1000 km):	-146.3 dB
Polarization Loss:	-3.0 dB
Atmospheric and Ionospheric Losses:	-1.0 dB
Isotropic Signal Level at Spacecraft:	-139.3 dBW
Spacecraft Uplink Antenna Gain:	0.0 dBI
Spacecraft Receiver System Noise Temperature: 100 K	
Spacecraft G/T:	-30.0 dB/K
Spacecraft C/No:	+59.3 dB-Hz
Spacecraft Eb/No at 1200 bps:	+28.5 dB
Spacecraft Eb/No at 4800 bps:	+22.5 dB
Required Eb/No for 10E-5 BER:	13.8 dB
Link Margin, 1200 bps, max slant range:	14.7 dB
Link Margin, 4800 bps, max slant range:	8.7 dB

Margins are adequate at both uplink speeds for a modest transmitting station, although, as with the high speed receiver, it will be necessary to add frequency tracking to a transmitter to be used at 4800 bps.

Performance on the uplink is expected to be adequate to meet all mission requirements

The L band ATV uplink requires much more performance from a ground station

User TX Power Output (100.0 Watts)	+20.0 dBW
User Station Losses:	-2.0 dB
User Station Antenna Gain (32 foot dish)	+39.0 dBIC
User Station EIRP:	+57.0 dBW
Uplink Path Loss (1265 MHz at 1000 km):	-154.5 dB
Polarization Loss:	-3.0 dB
Atmospheric and Ionospheric Losses:	-1.0 dB
Isotropic Signal Level at Spacecraft:	-101.6 dBW
Spacecraft Uplink Antenna Gain.	0.0 dBi
Spacecraft Receiver System Noise Temperature: [illegible]	
Spacecraft G/T:	-20.0 dB/K
Spacecraft C/No:	+107.0 dB-Hz
Spacecraft Signal Level (in 10 MHz bandwidth):	-37.0 dB

This is marginally acceptable, since a 35 dB signal to noise ratio is considered adequate for P4 or P5 picture quality

Unlike the other link margins, this calculation is done for a 1000 km range It is assumed that video uplink will not be attempted at the horizon, but rather during "good" (high elevation) passes.

This transmit signal level represents a siz-

able ground station. Fortunately, it will not be necessary to track the satellite with the 32 foot dish as it moves rapidly across the sky, but only to point the dish where the satellite will be at some instant in the pass, then start transmitting video. Although it will only be within the narrow beamwidth of the dish for a few seconds, it will only take the satellite 1/30 of a second to capture a single frame, once synchronization is established.

MICROSAT Costs

The MICROSAT spacecraft is a new satellite concept and must undergo the development engineering associated with such a project. In a business environment, this non-recurring engineering is a major portion of the cost of the first programs to use the new satellite. In this case, however, volunteers are providing much of the non-recurring engineering. In order to share this burden, AMSAT-NA is trying a unique approach to cost sharing. For the first time AMSAT will launch four satellites on a single mission. All of them will be of the MICROSAT design. The six organisations participating in the activity will be TAPR, AMSAT-NA, AMSAT-LU, BRAMSAT, Weber State College, and the ARRL. In this way, the non-recurring engineering can be shared over all four MICROSATS and several organisations.

The TAPR and AMSAT-NA organisations will be involved heavily in the development of the satellite system. Volunteers from both organisations are providing engineering effort to offset the cost of the development.

Project Status and Milestones

Informal MICROSAT proposals were initially made in November 1987. A Preliminary Design Review was held in Boulder, Colorado on June 2nd to 4th, 1988 and a software group meeting was held on September 17th and 18th, 1988 in Washington, DC. A Final Design Review will be scheduled soon; integration and testing will begin early in 1989 in order to meet a launch date later in the spring.

A prototype flight computer has been completed and is being used for software development. Prototype transmitters and receivers are nearing readiness for testing as are AART boards. A mechanical assembly has been constructed and shake tested very successfully. CAST volunteers have been testing a low resolution camera of the model intended for flight.

Weekly or bi-weekly reports that follow will contain information about individual team members and their progress on their parts of the project. Ground station equipment and project utility will also be treated.

Glossary

AART	Addressable Asynchronous Receiver Transmitter
AMSAT	The Amateur Radio Satellite Corporation
AMSAT-LU	AMSAT of Argentina
AMSAT-NA	AMSAT of North America (US and Canada)
ARRL	The American Radio Relay League
BCR	Battery Charge Regulator
BER	Bit Error Rate, a ratio
BPSK	Binary Phase Shift Keying
BRAMSAT	AMSAT of Brazil
Canted Turnstile	Turnstile antenna where the elements do not all lie in the same plane but are symmetrically bent out of it
C/No	Carrier to Noise power density ratio in a one Hz bandwidth
DOVE	Digital Orbiting Voice Encoder, Peacetalker, the MICROSAT of BRAMSAT
Eb/No	Energy per bit, noise power density
EDAC	Error Detection and Correction
FM	Frequency Modulation
FSK	Frequency Shift Keying
G/T	Gain per noise temperature (often referred to as the "Figure of Merit")
HDLC	High-level Data Link Control procedures
HT	"Handi-Talkie", amateur jargon for hand-held transceiver
IF	Intermediate Frequency
ITU	International Telecommunications Union
LEO	Low Earth Orbit, generally, circular orbits up to 2000 km above the surface
LNA	Low Noise Amplifier
LUSAT	AMSAT-LU MICROSAT, an orbiting mailbox
MICROSAT	New AMSAT-NA satellite bus concept
MS-DOS	Microsoft (c) Disk Operating System for personal computers
NiCd	Nickel-Cadmium, a battery cell type
NRZ-I	Non Return to Zero - change on one (Inverted)
NRZ-L	Non Return to Zero - Level (digital data)
NTSC	National Television Standards Committee
OSCAR	Orbiting Satellite Carrying Amateur Radio
Packet Radio	Digital radio communications using the AX.25 protocol
PACSAT	Packet Radio OSCAR of AMSAT-NA, specialising in electronic mailbox services
PC	Personal Computer
Quadron	Quadron Service Corporation, Santa Barbara, CA.
RAM	Random Access Memory, generally read/write
RFI	Radio Frequency Interference
ROM	Read Only Memory
S/N	Signal to Noise Ratio, also known as SNR, a measure of signal quality
TAPR	Tucson Amateur Packet Radio Association
TBA	To Be Announced
WEBERSAT	MICROSAT of CAST at Weber State College, Ogden, Utah

ar

INTRUDER WATCH

REPORT FOR JUNE 1989

Gordon Loveday VK4KAL
Federal Intruder Watch Co-ordinator
"Aviemore"
Rubyvale 4702

On this, my first summary of events for June, I am not going to "become a new broom", they never have much effect and if used vigorously, soon wear out! I hope to carry on the job as Federal Co-ordinator, as ably as the first Federal Co-ordinator, back in 1967. I will also remain VK4 Co-ordinator.

For the month of June, I received logs from VK's 2COP, 2EYI, 3KH, 3XB, 4BG, 4OD, 4AEM, 4AKX, 4ANL, 4BHJ, 4BTW, 4BXC, 4EKA, 4NJQ, 4VJT, 5GZ, 5TL, 6XW, 6RO, 6NHX. To these "up with it" amateurs I say Thanks. For the rest of the call holders, not listed, how about joining us?

On looking through the logs, I find a few which need more work on the part of observers. the concentration of listening coupled to "dial twiddling" to ascertain the frequency shift of RTTY stations. . .this can give fair accuracy as to identifying the operator. I think also MORE time could be given to persisting with Broadcast Stations to get their CALL SIGNS, THIS IS MOST IMPORTANT, otherwise that logging has little value. I want call signs as well as frequency.

One old pest seems to have joined us again. .FISHING BOATS. .on 80m band, although these are at S9 most times and jump all over the band. there is little we can do about it UNLESS we in VK can PROVE BEYOND DOUBT that they are OPERATING within our territorial waters. As far as Japanese boats are concerned, they were asked (directed if you like) by their authorities some years ago to desist from 80m use. To date I have not heard any Japanese boats. but this does not say they are not operating again.

So I close this month, with a challenge to the "unenlightened" Australian amateur to join the IARUMS and defeat the efforts of ILLEGAL intruders. show them WE WILL NOT BE WALKED OVER. 73 'til next month.

Intruders reported for June 1989

Freq	Mode	Date	UTC	ID	Comments
7007.2	mxd	mni	1155+		Possibly "Mars" Net
7002.5	A1A	"	1215+		Possibly Beacon in USSR
7005	A3E	16589	0700		B/C Station P/L Japanese
7015	R7B	mni	1025		4-5kHz wide cont
7041.5	.	09689	2237	?	Could be AMTOR???
7047	?	16689	0334	?	As above
14001	A3	mni	1527+	4XZ	Weather (wx) FAX Daily basis
14002	A1A	40689	1203		VVVVVVV Continuous
14004		09689	0910		Spill over from 13 mhz
14007.5	B9W	mni	0650+		
14011	A1A	30589	1300+		Hi-speed telegraphy
14017)	R7B	90689	0703+		Voice freq telegraphy
14023)					guard carriers
14023.5	F1B	mni	1125+	UMS	USSR Naval Station
14038	R7B	19689	1206		
14045	A3E	mni	0530+	?	Pacific Radio Telephone System
14060	A1A	20689	1000	PKJ	CPQ de PKJ QSV K zan QSV
14065	Non	mni	1212	VRQ	
14067	A1A	30689	1030	QXT	Calling "(MFK"
14058.2	?	6589	1051		Series Dashes with some traffic
14070	A1A	10689	1030	VBX	VPO de VBX K R MSG?
14070	Non	mni	1200	VRQ	5 letter groups
14074	A1A	mni	0700	VRQ	CQ de VRQ AS
14075	A1A	mni	0705	VPC	BFQ de VPC
14079	A1A	20689	0132	KFB	CQ de KFB Traffic out
14079.5	F1B	30589	0943	?	RTTY Idling
14100	A1A	10689	0928+	NZB	ZBK de NZB
1401.6	A7A	15589	1046		
14116	A1A	02689	0403+	DVHT	CQ de DVHT-OU8R de DVHT
14120	F1B	14589	1403		RTTY idling 1000 Hz shift
14121/23	mni	22589	0837+		Multi-mode Multi-channel
14137	PO	90689	0630/40		"Motor-bike"
14140	R7B	10689	0320+		
14150	F1B	15689	1406		RTTY 5 kHz wide
14160.5	F1B	02689	0927+		RTTY 1000 Hz traffic
14170	PO	16689	0519+		"Motor-bike"
14170 5	A1A	mni	mni	UMS	USSR Naval Radio (also F1B) 5 fig Trf
14184.5	F1B	03689	0766+		RTTY 500Hz Traffic
14200	A1A	15689	0900+	VMO	VLQ de VMO
14202	FSK	15689	1010	8XIO	RZWF de 8XIO. . .repeated
14206	A1A	06589	1045+		Coded letters and figures
14210	Multi	31589	0930		Multi-mode transmission
14212	F1B	16689	0927+		RTTY 1000 HZ Traffic
14217.1	FSK	27589	0024		
14218	F1B	15689	0927		RTTY 500 Hz idling
14250	A3E	mni	mni		Russian B/cast Station
14297	A2	8589	0436	ZOR	ZOR K
14302.3	F1B	30589	0957		2 Carriers 300 Hz shift
14316	F1B	22589	0503+		RTTY
21000-2	mni	09689	0410		Radio Telephone. .? French origin??
21120	A1A	29589	0310/15	A6L	CQ de A6L UI 38K
21127.4	FSK	09589	0351+		
21150	A1A	Daily	0355	CQ5	Chinese Diplomatic Station Beijing
21161	A1A	26589	0530+		"Piccolo"
21310	A3E	8689	0604	???	Foreign Language B/caster
21326	A1A	mni	0500+	WG6	PBU de WG6
21327	A1A	mni	0500+	HDE	PVE de HDE Traf out
21341 5	OHR	8689	0420		Pulse
21345	R7B	29589	0607		3kHz wide
21348	A3C	21689	0554+		Syncro pulse
21380	F1B	31589	0552		Teletype wheel??? Cud be AMTOR
21391.5	F1B	31589	1015+		RTTY 3kHz. . continuous
21449.5	A3E	mni	mni	Moscow	Radio Broadcast Station USSR
28229	A3	5589	1055+		VIT NUKDT
28573	A3E	28589	0950+		Broadcaster possibly USSR????
28000					

Finale with Thanks

May I say thanks to all of you who've helped me with IW Last month was my last Column and the new co-ordinator is VK4KAL Gordon Loveday, "Aviemore", Rubyvale, 4702 Qld Please be sure to give Gordon your continued support

I hope the IW service becomes better equipped and trust that you will ALL help to keep the bands clear.

A special thank to the VK6 clan who've made lots of equiries, and are once again supporting this service to the fullest

I've had to resign this portfolio because of the lack of time I have to dedicate to it I leave you all in goods hands.

73's Yours in AR
VK4MWZ-FIWC retired
Bill Horner

TELL
THE
ADVERTISER
YOU SAW IT
IN AMATEUR RADIO

ALARA

ALARA Birthday Activities

Joy Collis
VK2EBX
PO Box 22
Yeoval 2868

Activities held to mark ALARA's 14th birthday (26th July) included the Birthday Activity Day, 22nd July, Birthday Net and general meeting 24th July, and VK3, VK5 and VK6 luncheons to mark the event. Far from being a type of run down ladies' auxiliary (as suggested in another Amateur Radio Magazine recently), ALARA's membership continues to increase steadily, and its members are involved in every facet of amateur radio activity.

This does not detract from the great work done in various organisations by ladies' auxiliaries, without which many of those organisations would be unable to function, but that is not the role of ALARA.

Forthcoming YL Contests

JLRS 18th Party Contest:

Phone: Sept 23rd, 0300 UTC to Sept 24th, 0300 UTC.

CW: Sept 30th, 0300 UTC to Oct 1st, 0300 UTC.

Exchange: OMs, RS, or RST, & QSO number starting at 001. YLs, RS or RST & QSO number starting at 2001.

Separate numbers for CW and Phone Contests.

Entry limited to either class A, more than 4 bands, or class B, more than 3 bands.

Log postmarked no later than 20th October 1989 to:

The Contest Custodian, Nobuko Wakabayashi JG1QGQ, 5-21-7 Meguro-honcho Meguro-Ku Tokyo 152 Japan

YLRL Howdy Days:

Wednesday 6th September, 1400 UTC to Friday 8th September, 0200 UTC

YLRL Anniversary Party:

CW Wednesday 11th October, 1400 UTC to Friday 13th October, 0200 UTC.

SSB Wednesday 25th October, 1400 UTC to Friday 27th October, 0200 UTC

Logs: to Carol Schrader WI4K, 4744 Thoroughgood Drive Virginia Beach, VA 23455, USA.

ALARAMEET September 29/30 1990

The 1990 ALARAMEET will be held in Dubbo, NSW, a city with many attractions, including the Western Plains Zoo, Old Dubbo Jail, excellent accommodation and restaurant facilities, parks and gardens. Within reasonable driving distance are the Warrumbungles, Wellington Caves and Burrendong Dam.

Anyone interested in what promises to be a most enjoyable weekend please contact Maria McLeod VK5BMT, 1 Hawkins Avenue, Flinders Park, South Australia 5025, for further information.

JOTA with a Difference

Many people are hesitant to participate in Jamboree of the Air because they are unsure how best to handle the situation, and maintain the interest of the scouts and guides with who they are working. Maria VK5BMT has come up with a slightly different approach to JOTA which may be worth considering.

"I have been licensed for three years and have participated in JOTA since my first year. My attitude is that those girls visiting our house for JOTA are not simply handed a microphone to talk, but they should first gain a little knowledge about amateur radio which helps most of them obtain their special badge. Each year I have groups of 6-8 brownies and guides, aged between 7 and 12 years, seated on our garden benches placed strategically in our hallway where my radio station is set up. Last year (1988) we had 21 visitors in three sessions of about one and a half hours each.

First we discussed my callsign, explaining how the "VK" part belongs to all Australian amateurs and then how each State is identified by a number. Then came the phonetic alphabet, each girl wrote her name vertically down the page and as I recited the entire alphabet they had to fill in the relevant letters. Next they read it back to me to become familiar with the sounds.

Last year I also introduced them to the Morse Code Key. One or two of them had some idea of the international distress call, and after I explained the letters "CW" and let them hear the short and long sounds, they all sent 3 short, 3 long and 3 short bursts to make up SOS. Still captivated, I then sent each letter of the alphabet in CW, while they all sorted out the dots and dashes that made up each letter, and filled them in alongside their name. All of them then had a turn at sending their own name, and some of them had a particularly clever touch! We then went onto the Morse Code numbers, and the older girls soon worked out what number 3 was, after I had sent numbers 1 and 2 - so they got to number 5, and when I explained 6 to 10 were the reverse of numbers 1 to 5, most of them immediately wrote them down. Everyone sent a number, and when we had worked out what to do about numbers such as 11, 20, 35 etc, there was no stopping them. The youngest sent me a '500'.

After that we found someone to talk to on the radio, but we had spent so much time with all the other things that each group made only one or two calls. However, each girl was very happy with everything, and I hope to see many of them back again in our house, where we will once again skip through all we have done so far.

They are a very attentive lot, and it is a pleasure to be able to have them here for JOTA, so all you other ladies who have been hesitant to do JOTA in case the youngsters become restless or bored, I would recommend a different approach and see what fun it is. Who else is going to join JOTA activities this year?"

Bits and Pieces

Operating from Wallis Island (FW) early in July were Alice N4DDK, Audrey N7HAT, Mary KA0OMX and Mary-Lou NM7N. This was a new YL country for many. If you worked them, QSL via VE7YL.

Congratulations to Joyce VK2MI and Clarrie VK3UE, both of whom have notched up 40 years as amateur radio operators.

Josie VK4VG has a Queensland net on Tuesdays at 0930 UTC on 3.570 +/- and would welcome YLs.

Bev VK6DE and OM Brian VK6AI "went bush" on another 4WD trip during July, and saw a little more of outback Australia.

Silent Keys

It is with deep regret we announce that Liz Zandonini W3CDQ has become a silent key. Liz was an amateur radio operator for 67 years, surely something of a record, and had many friends around the world. She was active in numerous amateur radio organisations, and regularly welcomed overseas visitors to her home. (Amateur Radio April 1987)

We were saddened to hear of the death in July of Brian VK5CA, husband of Marlene VK5QO. Our sympathy to Marlene, family and friends.

Errata

The gremlins have been busy once again! The following corrections should be noted:

ALARA Column, June AR: "Our Mavis"

Para 2, line 2: "Rupanyup" should replace "Minyip"

Para 10, line 6, "Continents" should replace "Countries".

ALARA Membership List, July AR.

VK4BET Betsy (not Betty)

VK6DJL Jan (not VK6PYL)

ZL2BOV Anne (not ZL2BOX)

To be added to membership list VK5FK

Apologies to all concerned.

Membership Fees

The cost of living has finally caught up with us, and it has been necessary to raise the membership fees, which have been static for several years.

The 1990 membership fee will be

Australian member	$8.00		
Overseas airmail	$6.50	Seamail	$4.00

Award Update

No	Date	Recipient's Name	Callsign	Stickers
148	7/4/89	Peter Kenyon	L30037	
149	13/4/89	Lois Gutshall	VK3FYL/WB3EFQ	
142	25/4/89	Rita Judd	G0EIX	5
150	1/5/89	Maria McLeod	VK5BMT	4

DIVISIONAL NOTES

"5/8 Wave"

Jennifer Warrington
VK5ANW

Deceased Estates Committee

Further to last months list, I am pleased to announce that Bob Clifton VK5QJ has offered to help, particularly in the Eastern suburbs, and the South Coast ARC has offered to take on the Southern suburbs. We are very grateful for both these offers

Bankcard and Visacard

You will be please to hear that these facilities are now available to members who wish to purchase goods from the Equipment Supply Committee, the Publications Officer, or for intending members wishing to pay their membership fees by this method. I suspect that there will be a minimum purchase amount, check the next Journal, or ask John or Ian for details.

Thanks to Channel 10

We have had two good reasons to say thank you to Channel 10 Adelaide recently. "Makin's Adelaide" apparently ran a very good segment on the Elizabeth ARC starring that "dynamic duo" Trevor Lowe VK5ZTJ and Tony Hunt VK5AH - congratulations to you both, I believe that it was one of the best pieces of PR that amateur radio has had for some time.

Our second reason was also Trevor's suggestion. That was, that John Harvey Channel 10's Special Projects Manager, gave us a talk and demonstration on Teletext, the result was a very informative and entertaining evening.

Silent Key

Friends of Marlene VK5QO and Brian Austin VK5CA were shocked to hear of Brian's untimely death on 22nd July. It was appropriate that many amateurs, including a number of ALARA members were present at his funeral to show, not only what he had done for the WIA (having held every council office except that of Fed Councillor and Treasurer, and being made Hon Life Member for his eight years as Journal Editor), but also for what he had done for ALARA, having been our Auditor for many years, and also for his invaluable assistance in helping us form our Constitution. A warm and friendly man, always ready with his sharp wit, "one of nature's Gentlemen", who will be sadly missed

Diary Dates

Tuesday September 26
Display of Members' Equipment - 7.45 p.m.

Bring along your Homebrew gear and be prepared to talk about it, and you could win yourself a cash prize or voucher. Our thanks to Merv Millar who donates the Millar Award for the best "newcomer" to homebrew, (or to encourage and "Old Timer" who tries his hand in new technology). Our thanks also go to John Moffat VK5MG from International Communication Systems, who donates a voucher for the best overall winner. ESC Vouchers are also presented.

VK6 Bulletin

John Howlett VK6ATA
27 Periwinkle Road,
[illegible]

The recent revival of the VK6 Bulletin by John VK6JX was most welcome, and no doubt his style was enjoyed by all. However, just as he was blowing the dust and cobwebs off the VK6 scene, another career opportunity came along, so John with family left the Perth suburbs for a leafy, greener side of life close to Bunbury, some 180km south of Perth.

When established in his new home, no doubt a decent mast and beams will spring up, and John will be heard working plenty of "Doggey Xray" mainly by those who have learnt morse. His move also means the Northern Corridor Radio Group has not only lost their secretary, but one of its hardest working members.

Two Perth Clubs held their AGMs in July, The Northern Corridor Radio Group elected Phil VK6ZPP as President, Alan VK6AE as Secretary, and Alex VK6APK was again trusted with the Club Treasure. Meanwhile up in them there hills, the Hills Amateur Radio Group chose Merv VK6APM as President and Secretary, Fred VK6UR Treasurer, Richard VK6BMW Vice President, and a committee of Norm VK6UV, Milan VK6ZH, and Ted VK6VL to lead them through the next year of activities.

The group has changed Club rooms and now meets in the Girl Guides Hall, Cnr Brady Road and Sanderson Road, Lesmurdie. The Guide Association is interested in amateur radio and it is possible that some of the guides will take up the hobby. A spokesman for the group suggested that it would be nice to have a couple of YLs in the Club by the end of the year!

Hamfest '89 will be held on October 8 at Carine College of TAFE. This was a good event last year, and promises to be even better this year

Besides trade displays, raffles, junk sales, WIA bookshop, demonstrations of all kinds, food stalls and home brew contests, it will be a meeting place for amateurs from all over the state.

Don't miss out this year. If you need help with accommodation, a place to part the caravan, or what do do with XYL and harmonics whilst you enjoy yourself, get in touch with the members of the Northern Corridor Radio Group, and they will help.

Callback to the 40mts Sunday broadcast, ring Phil VK6ZPP (09) 409 1156 or Bryce (09) 3349 9489. Letters sent tot he NCRG, PO Box 244, North Beach 6020, WA will be answered promptly

Many didn't know about this premier event last year, so make sure your friends know - tell them next time you meet. Don't miss out this year

VK4 Notes

Bill Horner VK2MWZ

The Jack Files Contest has been and gone for another year. I was very pleased to be able to partake and help to give some of you a few new shires. Some feedback already shows that there were a lack of stations operating in VK4. Perhaps you may be able to assist next year

Shires . . . Can you help?

Every Thursday evening a Qld net is held on 3.605 MHz starting at 10 00 UTC. Although you mightn't be interested in chasing this award, others are, and hence if you're able to give a little time on this net it will be appreciated. Some real rare one's are: Aramac, Belyando, Blackal, Douglas, Mirani and more

If any travellers grace us with your presence, could you let me know a few weeks earlier. I'm sure we can get enough people to work you for the shire that you intend travelling in

Continued from page 49

Deputy General Manager

Ross Burstal, VK3CRB, has been absent from the Executive Office on sick leave since the middle of June, but I am happy to report that Ross is well on the road to recovery. With Ross's enforced absence, the Executive Office has been operating with the General Manager plus three part time employees. ar

SPOTLIGHT ON SWLING

Sunspot Maximum Soon ?

Robin L Harwood
VK7RH
52 Connaught Crescent
West Launceston 7250

Well, we are now into a new season, and already I have been noting propagational changes On Sunday September 3rd, the S89a period commences at 0100 UTC, although Sunday September 24th is when the real alterations commence - that is when Europe goes off daylight saving. Most transmissions directed to northern hemisphere areas will be heard one hour later There were a number of alterations in the J89 period, when broadcastings scrambled to utilize higher frequencies, taking advantage of the rapid rise in sunspots

Incidentally, the latest prediction I have heard for the maximum is now December of this year to March next. Conditions on the higher frequencies particularly on 21 MHz have been phenomenal to say the least I have been able to work Europeans from as early as 0200 UTC, using a simple half-wave dipole The broadcasting portion is also excellent, with signals coming in on both the long and short path simultaneously, judging by the multi-path echo. Yet sadly, it looks as if there has been a tacit agreement by broadcasters to avoid using the 11 metre broadcasting allocation (25600 to 26100 kHz). Although there are some using it, now including Radio Moscow World Service, there is still only a handful of broadcasters there. The main reason behind this is primarily that many sw receivers in the developing world don't have the 11 metre band fitted.

There is one good signal on 25670 and 25900 kHz in Arabic from Abu Dhabi in the United Arab Emirates. Listen around 0400 UTC Radio Moscow World Service is on 25780 kHz to Africa The BBC World Service was on 25750 but isn't as strong as it used to be during the last peak in 1979. The VOA also seems to have abandoned this band

Jamming of Chinese language transmissions still continues. Both the VOA and BBC are still experiencing severe jamming of their transmissions in Mandarin. Taiwan also is heavily jammed, but this has always been the case since 1949. The authorities reportedly have made it illegal to listen to foreign broadcasters in Chinese, since the Tienanmen Square Massacre on June 4th. Contrast this with the situation today in the USSR, where the response from listeners to foreign broadcasters has dramatically escalated in the past twelve months, since jamming was removed late in 1987.

Radio Canada International has been heard here at 0515 and 0545 on 15255 kHz in English to Africa with excellent signals. At 0400, they utilize Radio Austria International senders on 15270 kHz to the Middle East in English. The hours will change from the 24th of this month. Radio Berlin International provides an excellent signal on 13610 kHz at 0230 in English to the Caribbean, with a relay of their African Service, which they think is of more interest than the North American Service, which is on from 0300 UTC on 11785 kHz. Incidentally RBI does have a very good DX session every fortnight, with regional editions in the other week. It is on Mondays towards the end of their transmissions. The North American Service of Radio Moscow also has a DX show on Tuesdays at 0250 UTC on 9765 kHz.

Incidentally you can hear a USB feeder of Radio Moscow World Service in Russian on 9180 and 9250 kHz around 0200 UTC. This includes Radiostansia Rodina ("Voice of the Homeland").

A friend recently resurrected one of the first receivers with which I seriously commenced short-wave listening. It is a National R3000 and was from 150 kHz to around 30 MHz. The set has no BFO or any accurate frequency readout. As well, its selectivity leaves a lot to be desired I have had fun tuning around with it, after more than a ten year absence. I do notice, using it, how more crowded the broadcasting allocations have become. The only plus I can find is the wider audio response, particularly on strong signals.

Well, that is all for this month. Hope that you do have fun listening around. Until next time, the very best of 73! ar

Electro-Magnetic Compatibility Report

Hans F Ruckert
VK2AOU
EMC-Reporter
25 Berrille Road
Beverly Hills 2209

Overseas EMC - Problems & Actions

1. VE3BBM writes about the Jack Revenscroft VE3SR case.

"This lawsuit continued for almost four years at a cost to the Amateur Fraternity world-wide of $75,000 The estimated cost to the Department of Communications (Comment: Tax Payer) has been $500,000 This latter figure is a verbal estimate, but considered realistic."

The EMC problems were solved when competent radio amateurs were permitted to do the work in their own time. The cost of required filters and ferrite chokes was less than $150 00 This case shows how inept and unsuitable the legal system can be in dealing with EMC collision cases, when the law is many years behind the times and the rapid technical developments.

2. The "CQ-DL" magazine now publishes a monthly paper on EMC cases. Hans Joachim Brandt, DJ1ZB is the contributing editor (Lohenstein Str. 7b, 8000 Muenchen) The first 2 page report dealt with an XYL who was only allowed to have an under-the-roof dipole antenna. This resulted in several EMC collision cases, affecting mainly VCRs in the four storey block of units. Amateurs of the "Distrikt Sued Bayern" were able to solve all cases with filters and chokes In the most severe case, the owner replaced his bad VCR with a better product which was immune. The other neighbours withdrew their "disturbance report" with the Post Office. Some team members are : DJ4CT, DJ9MF, DK1EB. The title cover page of the March 1989 "CQ-DL" magazine shows a suitcase containing over 30 items (filters, chokes etc), to deal with disturbances affecting susceptible appliances. Professional fieldstrength measuring equipment is also available.

(This writer has sent a copy of the titles of all EMC Reports published in "AR" since January 1982 by VK3QQ, and later by VK2AOU, to the DL-EMC team co-ordinator DJ1ZB)

3. "Amateur Radio and Common Market"

The DARC invited to Dusseldorf (West Germany) representatives of the ten Common Market countries, and Switzerland as observer, on the 18th and 19th of February 1989, to organise a common front of the 200 000 radio amateurs of the E G area to deal with EMC questions and other matter of common interest. It is feared that the common market business organisations will try to water down the reasonable and effective German EMC Standards established by VDE and DIN bodies during the last 15 years. New standards would then become EG-Standards (Europaeishche Gemeinschaft) causing many EMC collisions. It was decided to have a permanent international team at Brussels to support the Amateur Radio interests. ar

WICEN

Briefings

Trevor Connell VK8CO
PO Box 40441
Casuarina 0811

Introduction

1 This is a suggested format for a briefing. Items not applicable should be ignored. A comprehensive briefing is essential for two reasons. Firstly it forces the organiser to think out all aspects and make all necessary arrangements. Secondly, it gives all the necessary information to the WICEN operators in a logical sequence.

Sequence

2. Briefings and orders should always be given in the same sequence. These are:
   - A. Welcome and introductions.
   - B. Situation
     - a. General outline of event.
     - b. Any other communications support.
   - C. Task
     - a. A statement indicating what is required
   - D. Execution
     - a. General outline of how it will be achieved
     - b. How many are participating.
     - c. Time out and estimated time of return.
     - d. Movement
       - (1) Method.
       - (2) Assembly area.
       - (3) Frequencies
     - e. Maps to be used.
     - f. Type of traffic expected.
     - g. Individual tasks.
     - h. Other agencies involved.
     - i. Who's who in those agencies.
     - j. Action on vehicle break-down.
     - k. Action for vehicle recovery
     - l. Action on radio break-down.
     - m. Action if lost
     - n. Rehearsals.
     - o. Debrief

     Any questions
   - E. Administration and Logistics
     - a. Rations
       - (1) Type and number of days.
       - (2) Resupply.
       - (3) Cooking.
       - (4) Water
       - (5) Refreshments available
     - b. Dress and Equipment
       - (1) Clothing.
       - (2) Type of shelter available.
       - (3) Maps, compasses.
       - (4) Insect repellent.
       - (5) Mosquito nets.
       - (6) Radio equipment.
       - (7) Battery requirements.
       - (8) Battery resupply
       - (9) Battery recharging facilities.
       - (10) Petrol resupply
     - c. Medical.
       - (1) Location of first aid kit.
       - (2) Casualty evacuation.
     - d. Debrief.
       - a. Time and place.
     - e. Special equipment.
       - a. Test equipment.
       - b. Portable repeater.
       - c. RTTY
       - d. Generators.
     - f. Inspection.
       - a. Time and place for check of all equipment for serviceability.
   - F. Any questions?
   - G. Command and Signals
     - a. Location of Control/NCS.
     - b. Opening times for:
       - (1) Movement to area.
       - (2) Commencement of event.
     - c. Frequencies:
       - (1) HF
       - (2) VHF
     - d. Callsigns.
     - e. Radio Net Diagrams.
       - (1) Operations and Administration
       - [illegible]
     - f. Use of working frequencies.
     - g. Use of repeaters.
     - h. Use of telephone.
     - i. Security.
     - j. Any special instructions.
     - k. Lost communications procedure.
   - H. Any questions?
   - I. Thank operators for their attendance.

Footnote: The above lists assumes a warm climate. For those unfortunates who live in the southern regions, cold weather equipment would have to be considered.

Wicen Activities - November to December 1988

This is not an offical report - it expresses some of my thoughts and observations concerning the Bike Ride Melbourne to Sydney, over 1120km in 15 days, and the WICEN involvement.

Firstly, I would highly praise Dennis Furlong VK3XP, and Ian Stowe VK3FOX who both performed a major task in organising the WICEN participation, by surveying the route and initiating large volumes of paper work involving the daily rosters, measuring and pin-pointing the geographical positions for check points, evening briefings, arranging start and finish control stations,and allocating jobs to the large team of operators and helpers involved.

Col Pomroy VK3BLE and Peter Mill VK3ZPP as the VTAC (technical maintenance chaps) spent a lot of time and hill climbing, checking the 2m coverage over the route, afterwards ensuring all the portable and fixed repeaters were favourably located and doing their job

Organising now completed, the whole team went into action Because of the ride duration of 15 days, only just enough operators were available to fully man all start, finish and check-point stations A lot of work was done by so many, it's difficult to name each individual who contributed, large and small, but the whole involvement was successful and a credit to all concerned.

It produced valuable experience plus the nice feeling of being part of a busy team operating very well indeed

Lessons and experience learned, was how we were capable of performing in a serious situation. The part I rate highly was the close association we enhanced working with the St John Ambulance team Both our comms systems were smoothly integrated St John Ambulance base station in Melbourne with call sign VK3DX and VK3SJB were operational all day and night for the duration of the ride

Corp Supt Harry Van-der-Stoep was in charge of the St John Ambulance team, and he used VK3SJA to link our systems when necessary It was an excellent exercise working side by side with this very important service.

There was some concern about shortage of operators over the border, but working behind the scenes, VK1 and VK2 produced a team to join VK3, and this solved any operator shortage problem. It was great working with people from two states and the Capital Territory We integrated well and continued happily on as an efficient team

About 2200 riders left Melbourne - most finished the ride. 500 odd male and female cyclists from USA, Canada and other countries added to the interest - theirs and ours. We had lots of fun pulling each others' legs (men only) all of which added to the interest and enjoyment of the event

There were riders, both women and men, up to 78 years of age. I yarned to some and noted most, if not all, arrived in Sydney in good condition. (There's a subtle plug for myself!) Also, 30 or so variously handicapped men and women, young and older, completed the ride They showed wonderful courage and determination to succeed as they did

One small young mother, from America I think, towed all the way, a two wheel cart containing her bright little daughter aged perhaps three years Up hill and dale she continued on During rain, which fell at least nine of the days, the little one snuggled beneath a plastic sheet while mum rode on

Another man who has ridden the annual ride for five years, rode his penny farthing bike. Plenty of good food was served, although some of us got a little tired seeing exactly the same cut lunch every day - no complaints though, the catering was good.

We had free days in Orbost, Cooma and Canberra. It seemed everyone looked over Parliament House which really is magnificent The Science Museum is a must, should you go there

I recommend anyone to take part in any similar event - don't be shy - you will fit in, young or old, female or male

Will finish with a few words about our annual task since 1972, providing comms along the 250 mile (400 kilometre), five day Red Cross Murray Canoe Marathon - December 27 to January 1 each year

As usual a sizeable team of all ages and sexes did the job Yarrawonga to Swan Hill. This too is a valuable experience working in a controlled net alongside Red Cross personnel and the Victorian Land Rover Club who also do a major job setting up four check points each year, transporting the first aid team into check points, plus equipment and boat (safety boats) fuel, surveying the daily route on land for the canoe back up parties, WICEN and others, and also marking all the turns and directions through the maze of tracks along the river.

Close relations have developed with these other organisations and WICEN, so that should we be called upon in a serious situation, the routines and experience we have acquired would ensure smooth success

Again, don't be shy - if you feel like joining any WICEN exercise or involvement, you will be welcome and will enjoy yourself

Finally, although these comments deal mostly with the Bike Ride and Canoe Marathon, your attention is draw to Leigh Baker VK3CDP the State Co-ordinator, and his assistants, all of them, for several years doing a very big job in finally moulding WICEN (Victorian Division) into a smooth working team and efficient network, organised and documented, and recognised as such by the Police Department and other emergency services. K V Scott VK3SS ar

QSLs FROM THE WIA COLLECTION(17)

The WAZ Award

Ken Matchett VK3TL
Honorary Curator
PO Box 1 Seville Vic 3139

Three years ago, the "CQ" magazine celebrated the fiftieth year of its Worked All Zones (WAZ) award by offering a special certificate by working all 40 zones during the one year (1986).

The original idea of a "Worked All Zones" award was suggested in the now discontinued magazine "R/9" in November 1934. The magazine "Radio" (Radio Ltd, Los Angeles) that absorbed "R/9" proposed a slightly different scheme in its February 1936 edition (re-published in the January 1937 edition) together with a modified world zone map. It is this map that has remained virtually unchanged to this day. The magazine "The Radio Amateur CQ" which commenced publication in 1945 took over the earlier WAZ award, with the exception that the CQ award is valid only for contacts dating from 15th November 1945.

In the original introduction to the award we read (in "Radio" Feb 1936) under the title "WAZ, a DX yardstick", "Radio herewith presents a DX scheme believed to be much superior to any mere list of countries or continents worked. It not only provides an ultimate goal, which is all the more desirable because few will probably achieve it, but more important for the average DX station it provides a means whereby the progress of different stations towards that goal may be easily compared and concisely stated" The WAZ was for many a far greater challenge than the WAC award. This magazine states in the same article "WAC once the goal of every ham who was either mildly or enthusiastically interested in DX, has been "made" by such a large number of hams that it is no longer a badge of special distinction except in a few localities" It is interesting to note that the same thought may have been at the back of the CQ awards manager's mind when a 5 Band WAZ was announced by CQ in 1983 for confirmed QSOs with all the 40 zones effective from 1st January 1979 for each of the five HF bands

In its March 1937 edition, the magazine "Radio" made the following announcement "Some time ago we heard that ON4AU had worked all of the 40 zones, and just the other day we received complete confirmation from him on all 40. We want to congratulate Mr Maheu for this great achievement, as being the first ham in the world to contact the 40 zones and have them confirmed to our satisfaction".

The WIA QSL collection is indeed fortunate in possessing one of Mr Maheu's QSLs which is reproduced here. It may interest readers to know a few of the countries in difficult zones (in those days) that were contacted by ON4AU. Zone 2 VO6D (Newfoundland), Zone 16 U2NE, Zone 17 U9AV (Western Siberia) Zone 23 AC4YN (Tibet), Zone 26 FI8AC (French Indo-China), Zone 35 ZD2H (Nigeria), Zone 36 OQ5AA (Belgian Congo), Zone 37 17AA (Italian Somaliland), Zone 40 OY2C (Faeroes)

This remarkable man had many successes with his DX activities. His was the first station in Europe to contact Nigeria, Gold Coast, Guam, Bolivia and Hawaii (Hawaii on fone), and on 10 metres the first in Europe to work South America and Oceania (VK4 and VK6) A photo of the shack of ON4AU appeared in the April 1935 issue of QST The QSL reproduced here was for a QSO in September 1937 with VK3NW on 20 metres CW.

The WIA QSL collection also holds several QSLs of the pre-war VK3NW operator He was KF "Mac" McTaggart of Ormond, Victoria.

B-K44

This QSL dated November 1926 is one of the very first Belgian call-signs issued On the top right hand corner of the card may be read QRK R - which is still maintained as a Q code, as are QRM and QRN The QSS as explained in an earlier article is no longer used It meant "Are my signals fading?" The Q code QSB which has replaced QSS meant in early days "Is my tone

bad?" or "Is my spark bad?"

We note also the top right corner of the QSL. DC, RAC (rectified AC) and AC referring to the power supply used and the Q-symbol QRH. Today this symbol means "Does my frequency vary?", but in earlier days it meant "What is your wavelength in metres?" which accounts for the small letter "m" after QRH.

EB4AC

The new system of "intermediates" (see earlier articles for a full explanation) was introduced in early 1927.

The Belgian QSL reproduced here is undated, but would probably date from the late 1920s. In fact, it was quite common in the early days of QSL-ing not to mention the year of the QSO, the month and day generally being given.

This was particularly so in the case of short-wave listener reports. This QSL confirmed the reception of a report forwarded by an Australian SWL, with the call-sign OA-2084. In those days during which radio propagation experimentation by the average amateur was considerably more common than nowadays, a SWL report was very much appreciated by the majority of experimenters.

In the early and middle 1920s it must have been a most satisfying experience indeed to know that one's signal was actually being heard thousands of miles away on the other side of the world.

If you would like to play a part in building up the WIA QSL collection and to save something for the future would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along.

All cards are appreciated but we especially need commemorative QSLs, special event station QSLs, especially assigned call QSLs (eg VK3SIG), pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3139 or phone (059) 643721 for card pick-up or consignment arrangements for larger quantities of cards.

Why Bother Keeping a Station Log?

Once it was mandatory under the regulations governing amateur stations in Australia to keep an accurate log of all transmissions including tests and even unanswered CQ calls.

Some years ago, Australia followed a deregulatory trend which appeared to start in the United States and lifted the requirement to enter all transmissions in a log. However it was recommended to have a logbook in the shack to enter available detail of any emergency or distress communications heard.

No doubt many radio amateurs have discontinued to enter all general transmissions, while there would be a percentage who avidly keep a first class record of their contacts. Those who don't bother can be missing out on many benefits of keeping a log.

It will contain information on your station's ability to work into rare or difficult areas. And details of contacts with various countries, states, zones or continents worked. Of course, a separate tally list is often kept. By having dates on the list it's easy to track contacts back to the log.

Using a log to record changes in equipment, or licence upgrades, will add to making it a volume of enjoyment to look back on your development and accomplishments as a radio amateur.

Logsheet Alibi or Diagnostic Tool

Another value of keeping an up-to-date log is the matter of TVI and RFI.

Complaints from neighbours can be rationally dealt with by checking back to see if you were actually on air at the time the neighbour alleges interference. Without a log it can be difficult to remember whether you were on air at that exact time. The log may also detail whether there is a pattern to the interference or lack of immunity problem. Does the alleged problem occur only when you operate on 10 metres, or one or more other bands?

Some radio amateurs prefer to keep a computerised log, either making entries in real time, or keeping a handwritten log and transferring it into a computer daily or weekly.

Logbooks can be made up by ruling an exercise book in columns or a bookkeeper ledger. Better still, buy the WIA Logbook for radiocommunication available from WIA Divisional Bookshops.

Your log should be accurate, should contain all the information you require, and be simple and quick enough that you use it with ease. At a minimum you should include date, time, frequency, mode, station worked, signal reports, QTH and handle, and a check for QSLs sent and received. A log entry also has a comments section for noting any particulars of a contact.

If you don't keep a log, why not start today? It isn't too much bother and you'll appreciate your logbook in years to come.

(Adapted from "Keeping a Station Log", OST March 1989)

CLUB CORNER

Gippsland Gate Radio Electronics Club White Elephant Sale

On the evening of Friday 15th of September the Gippsland Gate Radio & Electronics Club shall be conducting their annual White Elephant Sale. The doors will open for stall holders at 7 30 p.m. and at 8 00 p.m for buyers. Strictly no sales before 8.00 p m

The sale is conducted at the Oakwood Park Scout hall in Heyington Crescent, Noble Park North (Melway Map 81 A-12).

A few tables are available on-site for stall holders with only some goods to sell. The club will accept a ten percent contribution of all goods sold. (With a maximum of $20 on individual items)

For further information contact the Secretary, Ian VK3BUF on 789 7339

Now in its tenth year, the GGREC Annual White Elephant Sale is one of the Melbourne's most important Club events - Don't miss it!

Six Metre Repeater

The GGREC has recently commissioned a Six metre repeater in the Dandenong area. Designed for FM voice operation, it serves the local needs of the South Eastern Suburbs Input is on 52.575 MHz and output on 53.575 MHz, antennas are vertically polarized and the call-sign VK3RDD (Dandenong District) is used.

Hardware is two modified RT-80 transceivers and a 6802 microprocessor controller built for the task. Its range and user facilities will be enhanced over the next twelve to eighteen months. The Repeater is wholly owned and maintained by the Club. Enquiries or comments concerning the repeater should be directed to GGREC, PO Box 98, Dandenong 3175.

Ian Jackson
Secretary

Brisbane North Radio Club - Amateur Radio Tutorials

Subject to sufficient interest by potential Ham Radio Operators, the above Club will run tutorials for people studying for the Novice Amateur Operator's Certificate of Proficiency, during the latter quarter of 1989 and the first quarter 1990

This year, students will proceed in their own time to study the course from the book, "Radio Theory for Amateur Operators", by Swamston, which costs about $40 The monthly tutorials will provide a suggested study plan, and are then designed to enable students to get assistance with problems they encounter, rather than being a full set of lectures. Tutors can of course be contacted in between times.

There will be nine tutorials, held on Thursdays, approximately month, excluding the Christmas break.

The dates will be Thursday 10 August, 12 September, 12 October, 9 November, 7 December 1989, and tentatively 4 January, 6 February, 2 March, and 23 March 1990. They will be held at the Hooper Education Centre, in the grounds of the Wavell Heights State School. Entry is at the top of the hill in Kuran Street, Wavell Heights, from 7 pm until 10 pm. The cost of the tutorials will be $20, and this covers membership for one year in the Brisbane North Radio Club. If you are already a member you are welcome to attend without additional payment

For further information ring either the Secretary Bill VK4BIL on 263 2630, or the Education Officer Trevor VK4ATS on 265 4974.

VK4 Disabled Persons' Radio Club News

The VK4 Disabled Persons' Radio Club (VK4BTB) was formed in 1983 following the death of Tony Burge VK4BAC. His family [illegible] Help Handicapped Enter Life Project (HHELP) in Toowoomba, with the express wish that Tony's name be perpetuated in some way. As his father says, "radio gave him something to look forward to each day"

As a result, the "Tony Burge Memorial Award" is available to amateurs and SWLs who acquire the necessary points. Details will be in next month's AR.

The main aim of the Club is to introduce people with disabilities to amateur radio, and where possible encourage and support them in their endeavours. The Club urges fellow amateurs to support these aims. One way of doing this would be by letting us know you are willing to help any disabled in your locality should the need arise.

If you are not able to help, but know of a disabled person who is either interested or could benefit from being shown the service/hobby, please let us know

This way we hope to create a reference library that could help someone anywhere in Australia or for that matter, overseas. We realise this could be a big undertaking and would appreciate offers from anyone who could assist in making and maintaining the library.

We can be contacted on Friday nights on our net on 3.590 MHz starting at 0900 UTC, or by writing to Box 3126, Town Hall, Toowoomba, Qld 4350, or by ringing Station Manager Roley Norgaard (VK4AOR), on (076) 96 7587, or Graeme Whitehead (VK4NYE) on (076) 30 8323.

RAOTC VK5 Luncheon

Years seem to go very quickly, and once again our annual get together of old timers and their friends is going to take place

We hope you will make your presence available on:

Tuesday 31st October 1989

at the Marion Hotel, Marion Road, Marion at approximately 12 noon for lunch at 1 p.m. A good day is assured.

As we do need verification of your attendance to facilitate catering arrangements, we would appreciate advice of your attendance before 1st October This year you pay as you go - $9.00 approx. for main course

With your attendance it will be another successful get-together

Please notify:

George Luxon VK5RX, 203 Belair Road, Torrens Park, SA 5062 or Ray Deane VK5RK 271 5401, or John Allen VK5UL on 344 7465

For those who wish to travel by STA bus, catch the 243 bus, Stop A3, King William Road (in front of Government House) 11.20 am to Stop No. 24, arriving at 11.58 am.

On the same day and time the ladies are having a luncheon, and any wives/daughters/friends who wish to attend should contact George as above. The ladies' luncheon proved quite popular last year.

Shepparton & District Amateur Radio Club Inc.

1989 Communications Day

The Shepparton & District Radio Club is holding its 6th Annual Communications Day on Sunday the 17 September 1989.

The venue will be the Shepparton Showgrounds which has proven to be a great location for Amateurs, Disabled Amateurs and families alike. The Showgrounds are located at the eastern end of High Street (Midland Highway) Doors will open at 10 a m

This venue is located in the City area and only a short walk from the Shepparton Railway station. A return train operates between Melbourne and Shepparton so you can leave the car at home and enjoy V-Line's comfortable country service

A large range of the latest amateur equipment will be on display with ICOM Australia, Measure Tech Support (Kenwood), Peter O'Keefe Electronics (Solar Cells/Computers) and a local communication company indicating their intentions of attending Those who like to purchase hard-to-get bits and pieces for home brew gear have not been forgotten, as traders of these goods will be in attendance. A trade table

will operate, so bring along those bits and pieces you have been meaning to sell

Shepparton offers a large assortment of Motels, so why not stay a night in our beautiful city, take in some of the other activities of the area at the same time and attend the Communications Day on the Sunday. There is plenty of room for a family BBQ to be set up at the venue. Tea and coffee is free, and lunch will be available for a nominal charge.

Talk-in frequency Channel 1 repeater on 146.650 MHz throughout the day in case you get lost. Give VK3SOL a call on the way to the site. The event has been well attended in the past, and draws Amateurs and enthusiasts from throughout Victoria and Southern NSW

A lucky door prize will be awarded on the day. The Shepparton & District Amateur Radio Club Communications Day at the Shepparton Showgrounds on Sunday the 17 of September. Contact the Club at PO Box 692, Shepparton, 3630 or Ross Taylor VK3KUF on (058) 21 9074 AH.

Laurie Gleeson
VK3KL
(058) 29 2334

The Western and Northern Suburbs Amateur Radio Club Inc.

The Western and Northern Suburbs Amateur Radio Club will be holding a Hamfest on Saturday 7 October 1989. This event will take place at our Club Rooms at Edwardes Lake Park in Seaver Grove, Reservoir, Melway Map: 18, Ref D4, between 10 am and 4 pm

As well as the Club Rooms, there will be a Marquee so that all activities can be undercover, in the case of inclement weather.

There has been a good response from major suppliers of communications and electronics equipment, who have indicated they will be presenting displays of their products. Here is a chance to see wide range of the latest ham gear available

If you have a small quantity of goods for sale, these can be sold on the Club tables, but those with larger quantities of components, surplus gear or reclaimed parts can arrange the hire of trestles from the Club.

Our catering section will have tea, coffee and soft drinks available all day, and of course our renowned barbecued hamburgers and sausages at reasonable prices, which if the weather is favourable, can be enjoyed at the tables and chairs under the trees overlooking the lake.

During the afternoon, the ladies can take part in the popular (with the XYL's) Annual "Radio Throwing" event.

For further information or booking trestle space, contact the Secretary Tom Page VK3AGH at the Club, PO Box 336 Reservoir 3073, or phone (03) 379 9315. ar

SHOWCASE

Nonmetallic Tower Guys - "Phillystran"

The effective alternative to troublesome steel guys

- Completely isolates a tower-guy system from the antenna field.
- Improves signal coverage by eliminating distortion caused by re-radiated signals.
- Provides quick, easy, maintenance-free tower installations.
- Assures a neater tower appearance with no more corroded steel guys, no troublesome ceramic insulators and no more worries about hidden damage caused by white-noise arcing

With electrically transparent Phillystran....

You don't have to compute guy lengths that cause resonance! You don't have to install insulators and cable clamps! You don't have to worry about the stretching or aging problems of conventional synthetic ropes! And you will never again be bothered by zapping, snapping and crackling across porcelain insulators!

Phillystran HPTG assures....

EFFECTIVE INSTALLATIONS, designed to improve signal coverage because the non-metallic guys cannot absorb or re-radiate your radio signals

MAINTENANCE FREE INSTALLTIONS because Phillystran HPTG provides tension-once and walkaway guying systems that aren't subject to extreme corrosion or to the hidden damage caused by white-noise arcing across insulators.

Phillystran is performance proven....

These insulator-free guys are protecting towers for knowledgeable amateur radio operators Since its introduction in 1973, Phillystran has been installed on more than a thousand commercial broadcast towers

Phillystran tower guys are protected by an extruded olefin copolymer jacket which provides excellent resistance to weather and abrasion To prevent damage by a brush fire or by vandals, short lengths of steel cable should be used in the lower portion of each guy assembly

Full details from: ATN Antennas
PO Box 80
Birchip Vic 3483
Telephone (054) 92 2224
Fax (054) 92 2666

Diamond Antenna Power/SWR Meters

The Diamond Antenna Precision Meter series covers the 1.8 - 1300 MHz spectrum with 5% typical accuracy No competitive meter equals their quality and performance.

The large meter scale is calibrated for Forward and Reverse Power, and Standing Wave Ratio (SWR) Switch Selectable Average (RMS) and Peak Envelope Power (PEP)

The Diamond SX-600 is unique, as it has two directional couplers, each measuring a set of inputs. Selection is by a rear panel switch. Band 1 is 1.6 - 160 MHz, and Band 2 is 140 525 Mhz. Typical accuracy 5% (10% Maximum) The SX-1000 combines features of the SX-600 with inclusion of the 903 MHz and 1240 Mhz bands.

Provision for optional meter lighting is through a jack on the rear panel (12V required, or use our AC adapter Model AC ADAP)

SX-100 PWR Meter F&R/SWR 3KW 1.6-60 Mhz $170.00
SX-200 PWR Meter F&R/SWR 200W1.6-200 Mhz $129.00
SX-400 PWR Meter F&R/SWR 200W140-525 Mhz $149.00
SX-600 PWR Meter F&R/SWR 200W1.6-160 Mhz &140-525 Mhz $239.00
SX-1000 PWR Meter F&R/SWR 200W1.8-160 Mhz &430-1300 Mhz $319.00

Enquiries to ATN Antennas
PO Box 80
Birchip 3483
Phone (054) 92 2224
Fax (054) 92 2666

Surface Mount Timing Crystal

Much of the Electronic Industry depends upon the "Watch Crystal" or "Tuning Fork Crystal" at a frequency of 32.768 kHz to provide correct time in a watch, clock, calendar, programme or electronic control system.

Fox is now offering this timing crystal in a surface mount package. This high reliability part is available on tape or reel and built to withstand high temperature soldering techniques such as vapour phase and infra-red. The frequency tolerance is ±20PPM at 25 c.

Full details and technical specifications can be obtained from Clarke & Severn Electronics, PO Box 129, St Leonards NSW 2065. ar

SILENT KEYS

We regret to announce the recent passing of:
Canon Monty Nell VK2JQ
Mr Dick Purdie VK2ARP
Mr F N Young VK2YMN
Mr O G Price VK3DQC
Mr Ken O'Farrell VK4OF
Mr J Giroud L40201
Mr R G Hooper VK5NL

Monty Nell VK2JQ

One of Australia's oldest licences became QRT when Monty Nell VK2JQ passed away in mid July. Monty was 88 years of age, and had held the same call sign since 1926.

Monty was a Canon of the Anglican church and during his life time of service lived at Quirindi, Moruya, Binba, Crookwell, Goulburn and Canberra. He operated as an amateur in each of these towns. He was a very keen CW operator, and continued to use this mode until quite recent times. Monty was Patron of Goulburn Amateur Radio Society for some years and, until his health deteriorated a few years ago, he operated his FT101E and some two metre equipment. He was always on look out for any of his old acquaintances and he spoke frequently of the net known as "home to lunch club", with which he was associated for many years.

Although retired as an active Priest for many years, Monty was always available to help out with church matters, relief of other Priests etc. He regularly visited the sick in Goulburn hospitals, and was a great source of comfort and a very sincere friend to many people.

He is survived by two daughters and three sons, his wife and one son having pre-deceased him.

I know how many friends Monty had made in the Amateur fraternity, most of whom have now also passed away.

He was a true pioneer of our hobby and few of his "school" are still with us. I doubt if any of us will be able to reproduce the enthusiasm and spirit which Monty and his friends brought to our hobby.

David Thompson VK2BDT
On behalf of Goulburn Amateur Radio Society Inc.

Stolen Equipment

Yaesu FT 101E transceiver, serial no 7K/301042. Stolen from the home VK5EZ, LE Hauber, 12 Moselle Ave, Glengowrie SA 5044, on 8/9 July 1989, Ph: (08) 295 6881.

OVER TO YOU

Key Clicks

The wordy battle on key-clicks has been interesting and I would like to join in. These are radiated signals and can start anywhere in the chain of circuits and amplifiers after the key, particularly in the antenna circuit.

It is all governed by the basic fact the the Resonant frequency of any tuned circuit is decided by the L and C in it, but the Free Oscillatory frequency of the same circuit is dependent on the L, C & R in it. It has two modes and more if coupled to other circuits.

The act of transferring AC power into an oscillatory circuit is a progressive build-up, depending on the Q, together with a free oscillation excited by the first $^1/_4$ cycle of rf energy. The first reaches a steady state in a a time dependent on Q. The free oscillation will die away in a time dependent on Q - a damped wave - a type B signal! The energy in this signal will depend on the amplitude of that $^1/_4$ cycle of rf! A similar effect takes place on removing drive from the circuit, the energy in the circuit dissipates at the free oscillation frequency. Decay rate depends on Q and any resistive loading by the rf source. In the case of pentodes and VFET's, this is negligible, but triodes and transistors act as damper diodes and absorb part of this energy.

If you key an early stage, these transient signals will pass through the following amplifiers, be they Class A, AB, B, or C. The interstage coupling will determine their production and linear amplifiers will ensure their faithful reproduction, for delivery to the antenna! Catch 22, tuned interstage couplings are potential producers and also act as filters! Broad band circuits give no filtering and transfer clicks perfectly! The message is clear - minimum circuits after the key and turn it on smoothly, spread it over 10 cycles at 7 MHz, and you wipe out a micro-second on the leading edge of your dot. Your Rx wouldn't have enough band width to know the difference! SSB is subject to all these problems, so watch your VOX. Use a wide-band mode, AM, on your Rx to hunt for clicks, a Ge transistor as an "anode" bend detector and a pair of phones is a pin-point outfit.

References on circuits are many, but I like the "Admiralty Handbook", 1931. Pages 377-379 tell the story, but it is easier if you start at page 364. "Wireless" by Turner is good, especially on coupled circuits, but that is another story. It does take more than a SWR meter to get a clean CW signal.

Technical topics. March is fine for a poorly compensated line circuit, an under dampened undulator or galvanometric recorder. In radio you deal with closed and open oscillatory circuits. As a post detector analysis it is fine. It is fortunate that our audio level discrimination is poor so that the "rounding" of dots by our tuning and filtering allows us to copy happily what are nearly half sine wave pulses.

Bob McGregor VK3XZ
2 Wiltshire Drive
Somerville 3912

Tough Present - Grim Future?

Times are tough at the moment, as stated by VK3YWV (AR July 1989). It is a luxury to operate amateur radio. So, we talk about it, discuss it at meetings, gripe about it on air, but what do we really do about it? WIA membership fee of $50 for 1989 gives a member a QSL outlet - a lot cheaper than postage, plus technical information, Hamads and many other items.

But some still wish to gripe. Look at it this way. What about the coming years? You now start to think, "I won't be able to afford it, equipment getting beyond our means, what will I do?" Well, I think it would be better to say, "What will we do?"

Has it ever been suggested that the WIA could apply for a Government subsidy? After all, it is in the best interest of our Government not to let the WIA, or any well established radio club, fold.

Many times amateur operators have come to the fore, and held communications together in National disasters. This should carry a lot of weight. If WICEN had not been around what would have happened in the case of Cyclone Tracy, or bushfires in the Dandenongs, or individual operators hearing distress calls? A lower tax rate on equipment would help to keep a few heads above water.

According to the Regulations, the Government can, and will, commandeer your station, and you if necessary, in the case of a National disaster. Price rises will end our Clubs and our hobby. Then what happens to our bands? You guessed it, there is already pressure being applied to take from us what has been fought for.

I think certain members don't realise what goes on behind the curtain. If they did they would get a jolt back to reality in finding what is involved in running a successful Club.

The time is not far off where, unless we tackle this problem, there will be a loss of members. It is now that we need unity.

I also work for a living and am trying to make ends meet. So, please don't desert an Institute that is doing its best to give you what you can't do by yourself. If Amateur Radio is going to survive, so must the WIA, but only by a combined voice. Help it, don't fight it.

Alan Williams VK3GAW
PO Box 137
Forest Hill 3131

TELL THE ADVERTISER YOU SAW IT IN AR

OVER TO YOU

Compulsory Co-Operation

I read with interest (page 16, App B, Par 25, s 1, in the DOTC booklet Doc 71 of March 89) that under an emergency situation an Amateur and Station are subject to a direction by a member of the Commonwealth Police or Services, State Police, an SES member and others some such

I believe we once had the pleasure and privilege of "offering" ourselves and our equipment for the alleviation of distress and discomfort.

Now that such "co-operation" is a matter of compulsory compellable compliance, it would seem advantageous for a Shire to ENCOURAGE in its bailiwick the construction of useful masts and towers Furthermore, perhaps grants may be sought from Councils to assist in the establishment of adequate aerial systems.

M G Suter (Rev) VK6SA
Box 261 Mandurah 6210
ar

More Members Needed

The case for raising the WIA fees to $70 per annum has been well documented, beautifully stated and presented to the members with all the pomp and self-righteousness that goes with it. The case for limiting the fee structure to a reasonable level has conveniently been pushed aside and put in the "too hard" basket. Most of the people concerned with these decisions must be in high income brackets, or are able to absorb such fee increases through their business interests.

The largest portion of members are in fixed income brackets. These incomes have not, over the past ten years, kept up with the CPI increases. The rise in housing rates and taxes, water and sewerage rates, electricity, etc are good examples of "real" loss of income. Taking into consideration the ever rising amount of the essential weekly grocery bill, the fixed income earner finds him or herself hard hit with even a small increase in fees. There is also the ever increasing fear of redundancy in the workplace, through companies tightening the belt due to the high interest rates on their overdrafts.

All this makes a good case for NOT increasing the WIA fees Most members of the Institute are also involved with associated groups, such as local amateur radio clubs, computer or packet radio groups, building and maintaining repeaters, and the list just goes on and on. Many amateurs are involved with service and sport clubs. Add up all that the individual is paying out or putting money toward, and you will see why the WIA creeps to the bottom of the list when it comes to membership fees.

Seventy dollars WIA membership, $30 station licence, $25 local club members, $20 computer or packet group. Add to that the donations to club projects, such as repeater building and maintenance, Club activities and field days etc, and you find the average amateur shelling out $500 a year All this before he can think of any project or improvement to his own equipment.

Now, take a look at NON members. They have all the benefits of the WIA as well as of the local clubs without paying a cent. Does that not suggest the obvious answer?

A campaign to attract all amateurs should be commenced immediately. The lurks and perks, now enjoyed by Non members, should be cut out to show that our finances just cannot support freeloaders We should have a minimum of 95% membership, which would make a membership fee of $50 a practical amount, and hold fees stable for quite a few years with careful management of finances.

I have been a member of the WIA since the early 70s and have always supported the Institute, but even I will be looking closely at my finances to see if I can afford $70 a year for the WIA. I can go on enjoying my hobby, whether I pay it or not. The Wireless Institute will lose members and consequently, the fees will go up again.

In the end, only those in the upper income bracket will be able to pay them. Perhaps now is the time to ask ourselves: "Will there still be a hobby called 'amateur radio' in ten years time, or will it be denigrated to becoming a toy for the idle rich?"

HWM Kop VK5KUJ
Box 587
Port Lincoln 5606
ar

SM7PKK Pacific Tour 2 - 1989/90

Here is some information about my next DX-pedition to the Pacific. In comparison with the first trip, I can't give as much detailed information. That is because I want to be as flexible as possible. A group in EU are planning one or two major DX-peditions which I might join. But, if they are not to take place, I shall visit these places instead:

3D2KK	Fiji
T30	West Kiribati
5W1HK	Western Samoa
ZK3 (KK)	Tokelau Islands (Atafu Atoll)
KS6/SM7PKK	Am. Samoa (will change prefix this time)
ZK1	South Cook Islands

Should there be any money left after that, then I will include more Islands until I am broke! I will leave Sweden October 16 and arrive in Fiji October 19; that is the only date which won't change HI! Since I will stay away for between four to six months, things might change, depending on what other DX-peditions are activating in the Pacific.

Frequencies

CW: I will transmit 5kc above the band edge and listen at least 5 up. Then I will QSY up to 25kc above the band edge for US-stations.

SSB: Just look around the usual DX-frequencies. There is no point in giving any QRG here, since too many other DX-peditions will take the same anyway.

Sponsors

For this DX-pedidition I am sponsored by:
EUDX Foundation
Naval Electronics AB
Swedish Radio Supply
(Including a 1 kW PA so you should hear me.)

QSL-Info

Cards should be sent to my homecall. Please SASE and don't mix QSLs for different Operations!! I have different managers In return we will send you QSLs for all contacts you've had with me from the operation you worked, even if you just send QSL for one QSO - fair enough?

My Address
Mats Persson
Batesv 22
S-240 10 Dalby
Sweden

73 de Mats SM7PKK

PS: While being QRV at home, people have asked me if I was a son of a millionaire since I will travel again so soon HI! That is not the case (could have been perfect!) I work hard for my money, still live in my parents house and love our hobby! ar

Repeater Co-Ordination

Are you, as a repeater builder or part of a repeater club, poorly informed about the Regulations, policy making and vital issues?

The West Australian Repeater Group (Inc) in VK6 have felt for many years that there is insufficient accurate information about all aspects of repeaters throughout the nation. Differences in interpreting regulations from state to state constantly occur Endeavouring to find out what the facts are is a slow, tedious, frustrating process Some way must be found to overcome these problems

The WARG (Inc) is founding a national repeater group to provide a focal point for information about all aspects of voice and digital repeaters - the primary means of doing this is packet radio

It is not intended to usurp the role the WIA plays in repeater management. The role of a national repeater group would be providing information on technical matters, licensing regulations etc, and to provide discussion on future directions It will take some time to build up a strong national body but it can and must be done

Already Packet bulletins have been sent out around the nation from the WARG (Inc) in VK6 and the response has been high (Ten enquiries in just two weeks)

If you would like to be a part of this national repeater group, contact VK6CC or VK6UU at VK6BBS, or if you do not have packet facilities write to the Secretary, Jill Weaver VK6YL, 47 Belvedaire Way, Lynwood WA 6155

It will take time to make this idea work, so let's get talking on Packet now if you want to further develop repeater systems

Will McGhie VK6UU
Technical Officer WARG
21 Waterloo Cr Lesmurdie 6076

HAMADS

TRADE ADS

SATFAX. Weather satellite picture receiving program for IBM XT/AT Displays in 64 colours. Needs EGA colour monitor & card, AM demodulator & ADC interface. $45 + $3 postage. RADFAX2 HF weather fax, morse & RTTY receiving program for IBM XT/AT. Needs CGA, SSBHF, FSK/Tone decoder. Also "RF2HERC" & "RF2EGA", same as RADFAX2 but suitable for Hercules & EGA cards respectively $35 + $3 postage All programs are on 5.25", 360K floppy + full documentation Only from M Delahunty, 42 Villiers St, New Farm 4005, Qld, Ph: (07) 358 2785.

AMIDON FERROMAGNETIC CORES' For all receiver and transmitter applications. Send large SASE for data and price to RJ & US Imports, Box 157, Mortdale NSW 2223 Closed during August. (No enquiries at office please . . . 11 Macken St, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove; Webb Electronics, Albury, Electronic Components ACT; Truscott Electronics Vic; Willis Trading Co WA; Associated TV Service Hobart.

FOR SALE - NSW

YAESU FL2100Z linear $1100, new condition, original carton, with manual. Few hours use only. Dave VK2CDB (02) 543 4137, (02) 522 4852 QTHR

2 METRE 100W linear amplifier unassembled kit DSE K6313 in original packing $200. Unused boxed WW2 valves 12SK7 6H6 $2 each or $40 hundred. Ian VK2ZIO (02) 680 2112 QTHR.

TL922 Kenwood HF linear amplifier excellent condition, great performer $2600. Scanner, Realistic PR02004 300CH 26-1300MHz $575. Don VK2WU QTHR (049) 59 6335.

MFJ 1224 RTTY CW ASCII Amtor computer interface with leads and program, suit C64, as new $160 plus postage, Brett VK2DOM (02) 570 7609

YAESU FTV700 70cm transverter, 14 el ATN 70cm yagi $400 Yaesu FT2FB 12 channel xtal 2 metre mobile $150 2 x 6 el KLM 70cm yagis $30 each. Kenpro KR500 elevation rotator $350 ONO. Steve VK2ZSC QTHR (02) 674 2104.

ANTENNA TH6 DXX Thunderbird Tri-bander 14, 21, 28m purchaser to pay freight $300 Rej VK2BMQ/VK1MP (062) 47 9223 AH.

SIX Metre IC505 10 watt Digital SSB/CW TCVR, swap/sell for Kenwood RZ1 RX. Nev VK2QF (063) 73 8624 AH

YAESU FT 7B HF transceiver owners manual, good cond $500. Chimadia CE-42 15-10 metre DVO-band beam $150. Kevin VK2FUO QTHR (060) 21 6845.

LINEAR amplifier HF bands runs 4CX1000A passive grid, B & W tank vacuum capacitors C-Core transformers floor standing, VK2DTR (02) 918 3835.

SOCKETS for 3-500Z, 4CX1000A or 4CX1500B (SK600B) + chimneys, VK2DTR (02) 918 3835.

DECEASED estates - Yaesu FT101E transceiver $450; FL2100B linear $900; FT207R SM portable, PA2 adaptor $180; Lunar 2M4-40P amplifier $120; Heiray peak power meter $50, Asahi 10-15-20-40-80m mobile antenna $90, Tono 7000E computer $400; DSE GP100 printer $150; Robot 400 SSTV $400, Hamvision SSTV & Camera $250; 13.8V, 2A regulated supply $20; Phillips PM2410 multimeter 30VA, spare movement $70; Sony TC100A cassette recorder $15; Ralmar door intercome $40, Pioneer PAX30F 12", 25W coaxial speakers $50 pair; 110V muffin fans $6; FSK/AM/CW exciter 15W, 1-75 MHz $60, Telefunken FK446 colour camera $450; IEI 500MHz movement detector $60; Roller inductor & counter $100; Sony Helical scan tapes $5 - Bob VK2CAN (02) 416 3727.

OREGON mast 12 metres, 2 piece lower half 70 mm sq, upper half 50mm sq $75. Nev Shaw VK2FJ, 16 Hynes Place, Camden East (046) 55 1577.

KENWOOD 520S External VFO CW filter, spare finals VGC $500 - (065) 62 5755 VK2CVR QTHR.

FOR SALE - VIC

YAESU FT-221, all mode 2m transceiver, complete with Mutek RF Front End Board, YC-221 Digital Display and Handbooks $500; Kenwood TM 421A 35W cm FM transceiver $500; Kenwood 2m 10W FM transceiver type TR-7200G $125 - Roy VK3ARY QTHR (03) 807 4798.

VALVES, Moorabbin Radio Club "Valve Bank" thousands of new and used receiving and transmitting valves at reasnable prices. Ken VK3ZFI, QTHR (03) 580 5347.

FREE; Teleype Mod15 page printer and teletype Mod14 typing reperforator. Working condition - Les VK3KD (03) 895 1405.

HF Linear SSB all band/10-160 10W input, 120W output pair 807's suit FT7 with spares $200 ONO; Oskerblock 2 metre SWR 145 metre $80; Frequency counter 20 MHz - 200 MHz dual range $75; 2 S2001 or 6146B's new cond $30 ea; QRP rig drew diamond 1986 project 80 mx Rx & Tx 5W, excel cond, complete $95 ONO - Ray VK3CDR QTHR (03) 726 9222.

DECEASED estate. IC271/A 2m all mode base station 25W 32 memories fitted with AG-20 pre-amp and w/shop manual $675; IC471/A 70cm all mode base station 25W 32 memories & IC-Agl masthead pre-amp $1100; FT 680R 6m all mode mobile 20W PEP $225, FT 200 HF transceiver 3.5 - 28 MHz with p/supply $225, Transceiver homebrew "G2DAF" type 3.5 - 28 MHz & p/supply $50; Eddystone 680 Rx 15 tube 0 5 30 MHz var sel xtal filter $110; AWA Rx AMR 101 9 tubes 480 kHz 26 MHz using 6 plug in coil boxes (similar to HRO) $50; "Reception Set" R107 9 tubes 3 bands 1.2 17.5 MHz $25; Hygain TH6-DXX 6 elem 3 bands + 40 ft tower, + rotator (buyer to dismantle) $450; 60ft 3 leg tower (dismantled) $60; Beam 2m 11 elem $20; Beam Helical 70 cm 15 elem $20, Beam 6m (W/Wolf) 7 elem 25ft boom $100; Parabola's (3) 4ft diam $40 ea; Rack 6ft x 19" contains 100W 2m Am Tx 120W Modulator with all necesary p/supplies $60; Power supply contains "A & R" 1000-750-500V a side 400 mA transformer + filter chockes fil transformers etc $25; Sig Gen Marconi TF 144G 85 kHz 25MHz 8 bans $20; Imped Bridge Marconi TF 373D $20; Freq Counter homebrew 8 digit 30 MHz $45; FV-107 remote VFO for FT107 $60, Freq meter (Bandix) SCR 211 AK $20; Bench mike Yaesu YD844D $40; All items buyer to collect - VK3ATW (03) 579 1226 or Pat (03) 598 4806.

KENWOOD TS440S transceiver all amateur bands plus general coverage receive built in automatic ATU, had very little use, with mic and manual $1975; Icom IC2A 2m FM hand held with extra battery pack, charger etc EC $275 - VK3ARZ QTHR (03) 584 9512.

KENWOOD 1.8kHz narrow SSB filter suit TS430/440/130 etc $75 - VK3ARZ QTHR (03) 584 9212.

RECEIVERS FRG7 Yaesu communications receivers 500 kHz to 30 MHz excel order with manual $225, Eddystone 888A amateur band receiver in very good order manual $150 - VK3OM not QTHR (059) 44 3019.

TET HB443DX four band four element Yagi covers 40, 20, 15 & 10M in very good order $375 - VK3OM not QTHR (059) 44 3019

KENWOOD TS120Y orig packing $475; Microwave modules 432 MHz transverter 28 MHz IF suitable for Oscar $225, Icom 502 6m transceiver $180 Roger VK3XRS QTHR (051) 56 8291.

FOR SALE - QLD

DISPOSALS gear for sale at auction North Qld convention Townsville Sept 22-23-24, PO Box 964, GPO Townsville 4810 for details.

AEA Pakratt PK64 Modem with HFM64, packet RTTY, Amtor CW ASCII HF VHF suit C64 C128, software incl cost $700, sell $500 - VK4AI (07) 284 5688.

FOR SALE - SA

Telcon semi air spaced twin coax cable, 2kW to 2m, transmitter 6V6G osc 6V6 dblr 807 buffer 829B PA, 160 to 6m, transmitting tubes 4-65A, 4E27(813), Grundig reel-to-reel recorder (valves), 2 sets tubes for KW2000, Post-war tubes, receiving & TV, Admiralty Handbook of Wireless Telegraphy 1931 - VK5LC QTHR (08) 271 6841.

ANTENNA four element cubical quad for 10m and 15m $150 ONO - VK5KBE (08) 250 7259.

KENWOOD TM401B 70cm FM 25W handbook, circuits in excel cond $475 - Peter VK5AWP (085) 63 2782.

FOR SALE - WA

AMIGA users amateur radio group, send for details, if on packet give @BBS model - Larry VK6CP PO Box 46 Guildford WA 6055.

MOBILE shack consisting of 11ft caravan fitted with benches cupboards and single bunk, licensed, good tyres $990 - VK6EE (09) 459 9714.

FOR SALE - TAS

ICOM 720A HF all band transceiver $1000 neg; PCM Electronics MTU 100 Antenna tuner $400 neg - Peter (002) 23 1009.

WANTED - AUST WIDE

Information and/or identification of illegal operators on amateur bands, WARC could trim more kilohertzs, fight back, join IARUMS Reward, more space on our bands.

WANTED - ACT

VINTAGE valves types 57, 58 and 2A5 for pensioners' RX's, reasonable emission, all costs paid, please help - Jock VK1LF QTHR (062) 86 6920.

WANTED - NSW

2 1/4" Square (6x6) slide projector blower cooled, any cond, reasonable price, suitable for video to ATV - (068) 28 1542 BH, 28 1261 AH, Ron VK2FLG QTHR, Ron Pearson Box 47 Walgett 2832.

TWO 572B tubes for FL2100B Yaesu amplifier - Ron VK2BKN QTHR (069) 72 2021.

AR88 receiver, 22 or 122 transceiver, circuit diagram handbook for AR17 VHF receiver, MN52 loop box for radio compass MN26 - Ian VK2ZIO (02) 680 2112 QTHR.

YAESU FT-680R 6 metre all mode transceiver, good cond - Chris VK2YMW (02) 499 2818 QTHR.

VALVE tester with manual and/or manual for Palec VCT-2 valve tester - Andrew Kay (02) 555 1408.

WANTED - VIC

DELTAHET receiver any cond, working or not, or Racal RA17L - (052) 48 1410 AH.

COUNTER measures receiving equip from the RAAF Neptune aircraft, switch assemply unit SA/146/ALR8, remote control units, TYpe C 426/APR9 and C654/APR9; Also primary and secondary tuning gang covers and overall covers to suit the AR88 HF Comm Rx - W Babb VK3AQB (03) 337 4902.

KENWOOD R2000 receiver prefer with VHF converter, also valve type transceiver prefer Heathkit SB100/101/102 with power supply, details to VK3OM not QTHR - (059) 44 3019.

WANTED - QLD

GENERAL coverage HF receiver, eg R600 R1000 R2000 even Realistic DX300 etc, good cond only - Aub VK4AFO (070) 96 5962 or Fax (070) 96 6151, PO Box 102 Malanpa 4885.

WANTED - WA

CIRCUIT diagrams for Icom 280 and AWA 220 100W SSB, will pay all copying and mailing costs - Roo VK6JBW/3JBW (099) 811107.

CRYSTALS for 20M CW segment, any size prefer HC6U - VK6BWI QTHR.

HANDBOOK or circuit diag for Yaesu DX401,

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

Call Sign (if applicable): .....

Address: .....

.....

State and Postcode: .....

external VFO spkr for FT200/FLDX2000 - Maurice VK6NST QTHR (09) 419 2951 reverse charges.

WANTED - TAS

TRANSFORMER prim 230/240V sec 700V CT (2x350V) at 500mA, please write to Frank VK7ZFM QTHR.

AEM Subscriptions

Subscribers to **Australian Electronics Monthly** who still had issues owing to them at the time the magazine ceased publication were to receive an offer on their subscriptions from another publisher, as detailed in a release published in the April issue of AR.

Details of this offer were finalised in July and despatch of letters setting out the offer to all subscribers commenced in late July. If any AEM subscribers have not received such a letter, then they should contact: Val Harrison at the Apogee Group, who is handling the situation,

Locked Bag 888 Rozelle NSW 2039
Phone: (02) 555 1646

Outstanding AEM Listening Post Orders

Australian Electronics Monthly was handling software for this very popular FAX/RTTY/CW decoder until it ceased publication earlier this year. At that time, a number of orders were being held and a release in the April issue of AR indicated that outstanding orders would be fulfilled. Well, finally, after some delay, the situation regarding these orders has been resolved. The firm FT Promotions is now handling marketing of this software, among other products, and the outstanding orders have been passed on to them. These AEM customers are having their original orders returned along with a letter from FT Promotions offering to fulfil their requirements.

If you had an order "caught up" in this situation, and haven't yet received a letter from FT Promotions, contact them at
PO Box 547
Rozelle NSW 2039
Phone: (02) 818 4838

ADVERTISER'S INDEX

ATN Antennas 40
Blamac Pty Ltd 36
Dick Smith Electronics ..... IBC
Electronics Australia 21
Electronics Today International ..... IFC
Emtronics 46
Ian J Truscott's Electronic World 42
Icom ..... OBC, 32,33
Kenwood Electronics Aust. Pty Ltd 48
Magpubs 20
QD Electronics 44
Silcon Chip Publications 37
Stewart Electronic Components 23
WIA NSW Division Novice Licence 44
Wilkie Trading Co 28

TRADE ADS
RJ & US Imports 62
M Delahunty 62

HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclosed a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.

*A courtesy note will be forwarded to acknowledge that the ad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.

Conditions for commercial advertising are as follows: $22.50 for four lines, plus $2.00 per line (or part thereof) Minimum charge — $22.50 pre—payable.

State: .....

❑ Miscellaneous
❑ For Sale
❑ Wanted

Name: .....

Call Sign: .....

Address: .....

.....

The Ultimate 2 Metre Hand-held Transceiver

The FT-411 is a top-of-the-line ultra compact 2 metre handheld offering an incredible array of features without the size and weight of previous sets. Expanding on the microprocessor controlled features of previous models, the front panel multi-function back-lit keypad allows easy frequency entry, selection of the 49 tunable memories (which store repeater shifts, or separate Tx/Rx frequencies), setting of the programmable-interval 'power-saver' system, as well as a host of other convenience features. CPU control also offers 2 VFO's, rotary dial tuning with 5 selectable tuning steps, a multi-function back-lit 6 digit LCD screen with bargraph Signal/P.O. meter, and a range of scanning options. Even VOX (voice-activated transmit) circuitry is provided, allowing hands-free operation with the optional YH-2 headset.

Yaesu have also recognised that a hand-held radio must be ruggedly constructed, and yet be small enough and light enough to carry around all day. Through the extensive use of surface-mounted components, a heavy duty die-cast rear panel, rubber gasket seals around all external controls and connectors, and a carry case supplied as standard, the FT-411 will provide reliable operation even in dusty or humid environments while measuring only 55 (W) x 155 (H) x 32mm (D), and weighting less than 550 grams (including a high capacity 1000mAH FNB-14 NiCd battery giving 2.5W output). A range of inexpensive optional accessories are also available to provide flexibility for users differing requirements. See ARA review Vol 12 Issue 3.

Complete Package: FT-411, FNB-14 7.2V NiCd, Carry Case, Antenna, Approved AC Charger.

$499

D-3350

EXCLUSIVE 2 YEAR WARRANTY

Optional Accessories

PA-6	DC Adaptor/Charger suit FNB9/10/14	D-3498	$39.95
FNB-11	600mAH NiCd Battery (5W output)	D-3496	$99.00
MH-12A2B	Speaker/Microphone	D-2115	$49.95
YH-2	Mic/Earphone Headset	D-2200	$49.95

DICK SMITH ELECTRONICS

• **NSW** • **Albury** *21 8399* • **Bankstown Square** *707 4888* • **Blacktown** *671 7722* • **Campbelltown** *(046)27 2199* • **Chatswood Chase** *411 1955* • **Chullora** *642 8922* • **Gore Hill** *439 5311* • **Gosford** *25 0235* • **Hornsby** *477 6633* • **Hurstville** *580 8622* • **Liverpool** *600 9888* • **Maitland** *33 7866* • **Miranda** *525 2722* • **Newcastle** *61 1896* • **North Ryde** *88 3855* • **Parramatta** *689 2188* • **Penrith** *(047)32 3400* • **Railway Square** *211 3777* • **Sydney City** *267 9111* • **Tamworth** *66 1711* • **Warringah Mall** *905 0441* • **Wollongong** *28 3800* • **ACT** • **Fyshwick** *80 4944* • **VIC** • **Ballarat** *31 5433* • **Bendigo** *43 0388* • **Box Hill** *890 0699* • **Coburg** *(03)383 4455* • **Dandenong** *794 9377* • **East Brighton** *592 2366* • **Essendon** *379 7444* • **Footscray** *689 2055* • **Frankston** *783 9144* • **Geelong** *43 8804* • **Melbourne City** *326 6088* • **Richmond** *428 1614* • **Ringwood** *879 5338* • **Springvale** *547 0522* • **QLD** • **Brisbane City** *229 9377* • **Buranda** *391 6233* • **Cairns** *311 515* • **Chermside** *359 6255* • **Redbank** *288 5599* • **Rockhampton** *27 9644* • **Southport** *32 9863* • **Toowoomba** *38 4300* • **Townsville** *72 5722* • **Underwood** *341 0844* • **SA** • **Adelaide City** *232 1200* • **Beverley** *347 1900* • **St. Marys** *277 8977* • **Elizabeth** *255 6099* • **Enfield** *260 6088* • **WA** • **Cannington** *451 8666* • **Fremantle** *335 9733* • **North Perth** *328 6944* • **Perth City** *481 3261* • **Midland** *250 1460* • **TAS** • **Hobart** *31 0600* • **NT** • **Stuart Park** *81 1977*

THIS SCREEN CAN TELL YOU AS MUCH ABOUT THE IC-781 AS WE CAN.

The huge CRT display on this new HF transceiver will show at a glance all the functions we're about to describe here.

That's because it has a built in spectra scope for the first time, for programmable, multi-functional central monitoring.

Plus there's a VFO, A/B contents, memory contents, two menu screens, band scope, and 15 operational screens.

It also has a sub display, and its DDS system offers a lock-up time of just five milliseconds. So it's ideal for data communications systems like PACKET and AMTOR.

The dual watch function is a huge advantage on DX-peditions or when chasing DX-stations. And its computer-controlled twin PBT with high efficiency IF filter eliminates interference.

Maximum frequency stability is achieved at ±15Hz (0-50°C), which is more efficient than other transceivers on the market.

Also, the delay control noise blanker system is adjustable by up to 15 milliseconds.

There's a full and semi break-in function that can output up to 100 words per minute. And a p.a. unit that outputs 150W of power.

However, just because the IC-781 has so many state-of-the-art features, don't think ICOM haven't made it simple to use.

There is a built in 10-keyboard for easy operation. Or you can use the built in remote control communication interface-V system.

This lets you control your transceiver via a personal computer or other compatible equipment. Plus you have a 2 way sleep timer, and 5 separate automatic weekly timers.

For your nearest ICOM stockist, just call (008) 33 8915. And they'll tell you everything you need to know about the IC-781. Then once you've got one, the CRT display will tell you everything you need to know about what it's doing.

ICOM